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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

EDITED BY

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CONTENTS.

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I.—HUME WITHOUT SCEPTICISM (II.).

BY R. E. HOBART.

THE purport of the former article may be briefly stated. Propositions may imply but concrete data do not. Hence one event (called a cause) does not imply another event (called its effect) nor does the second imply the first. We could not tell from the completest examination of either that the other had existed or was to exist. The regular sequence of one upon the other is not indicated in their natures but is a fact found in experience. That the first event is charged with "force" (if so we believe), comparable to the force we feel ourselves putting forth in physical exertion, is in no wise inconsistent with this principle. Such a force would not by its nature portend or indicate the coming effect; it is only from experience that our minds conjoin the two. So again as to the necessity with which, in the belief of all men, events follow upon their causes; this is wholly consistent with our principle. That the second event is necessary means that alternatives are excluded; it cannot but follow. The mind contemplates alternatives to reject them. Since there is no rejection of alternatives in nature but only in the mind, necessity is a term which, though valid, has meaning (like probability) only from the mind's point of view. It expresses the mind's grasp on the inevitability, the fatal certainty, of the sequence in question. The idea of necessity in the relation of cause and effect, like the idea of forcible compulsion, is thus ultimately based upon that of a known actual order of events. This order is known only with a high probability, but in the ideas

of causation, necessity and explanation it is taken for granted as existing. Such were the chief theses of the first article.

We have now to ask whether Hume's two doctrines under discussion must be regarded as sceptical: first, his doctrine of the nature of cause, and, second, his doctrine of induction inferred therefrom.

I.

In the course of the first article there emerged two conceptions of "a cause": first, that it is an event upon which in all cases a certain other event follows; and, second, that it is an event upon which in a particular case a certain other event must of necessity follow. The first puts forward universality, the second necessity. In the second conception we do not refer to other cases of the cause at all, but we do refer to other conceivable sequels in the case before us, and we do so to exclude them as impossible. It was pointed out that the moment we enquire why they are excluded, why the sequel must of necessity follow, the answer is, "It always does"; which brings us back to the first definition as fraught with more information and more explanation. The second does but assert in regard to a particular case an inevitable sequence in which our ground for believing lies in a fact as to all cases, though we have left that fact for the moment out of view. The latter is the working conception of daily life.[1]

What confronts us then in daily life is a necessity that attaches to the single case. In this distinguishing fact, standing alone and unexplained in each case of causation, we see the source of the feeling that Hume's account, in mentioning sequence only, misses the pith of the matter. Here is the fact that has been taken for a deductive necessity by which the particular effect may be inferred from the particular cause. Here is the source of Dr. Whitehead's doctrine that "causal efficacy" is a thing whose whole nature is present in each instance, so that we may take cognizance of it in a single perception. Here is the source of the older view that we know the necessity of the effect by intuition, and of Kant's doctrine of a category of necessity, not to be resolved into mere sequence, without which category the

[1] In the first article the sentence (p. 300), "The nature of a cause or sufficient occasion may equally well be expressed in the hypothetical as in the universal form: if you use a certain means, or if a certain event occurs, such and such phenomena will ensue," should run: "The nature of a cause or sufficient occasion, so far as it bears upon a particular instance which has not yet happened or is not yet known, may equally well be expressed in the particular hypothetical as in the universal form," etc.

individual fact cannot be perceived. Now with this necessity attaching itself to the individual case there are two modes of dealing, at the outset equally possible. One, recognising the individual effect as necessary, declares that hence it will follow in every case and so deduces the universality from the necessity. The other, finding in the idea of necessity a puzzle which it seeks to resolve, is led by it to the other cases of the cause not by way of deduction but of enquiry, and ends by deriving the necessity in the individual case from the universality. How decide between the two? It is nothing but close scrutiny of the facts that obliges us to decide for the latter. The necessity turns out not to be deductive in nature. It is found that one never could in the first instance have *discovered* any necessity in the single case taken alone; it is the untraced influence of other cases upon us that leads us to view the individual case in the light of necessity, as the necessary happening of something—the suppressed reason being that it always happens. The key to the problem has been absent from consciousness and has had to be traced. It is Hume to whom the credit belongs of tracing it.

But though our conception of each case as it passes before us has required a key, which has had to be sought elsewhere, for its full comprehension, there is no clash between this natural daily idea and the account given by Hume. He supplements our view but does not alter it. His account has been termed by an adherent "a theory repugnant to common sense". But it is itself the theory of common sense. It is the same theory so far as common sense goes. There is no ingredient in our human ideas of cause and effect at odds with his account. We think of the relation in terms of succession, having no other terms in which to think of it. Dependence is a temporal idea; in a timeless world there could be none. And it need involve nothing but the temporal. What we seem at first to miss in Hume's formulas is the conception of a power exerted by the cause upon the object in which the effect takes place, compelling the effect to be. Hume, however, when we fully trace his meaning, does not deny such a power but asserts it; only he makes upon it a fundamental and subtle remark: namely, that any power is constituted by a law of sequence, which is therefore the bottom-fact: the law that if the thing said to "exert the power" makes the appropriate move, then that which is called the effect will take place. If this law should cease to hold, in that instant the power would cease to be. The idea of a power is the idea of such a law. Commonly philosophers had supposed that the power makes the law; that because the power is there, therefore in every instance

the effect flows from it (I am repeating as to power the remark about necessity) and hence the uniformity of sequence, that is, the law, comes to be. The service to philosophy that Hume performed was to point out that the law makes the power, or, more accurately, is the power; that the last word in the matter must be the law. In other words, once more, he did not deny the power in question, he analysed it. We may truly say that the cause compels the effect to be; that is, since the law is a fact, the occurrence of the one event *must* positively be followed by the other. But the idea of compulsion, like that of power, is here nothing but the idea of inevitable sequence; compulsion also is a fact that we come to know through experience of sequence. The further we push in this direction the more we see that all must rest upon discovered sequence. The ideas we employ thinking to transcend it are themselves compact of it.

The production or precipitation of one fact by another means something in the familiar order of things; the rendering of the second inevitable *under that order;* the occurrence of the first and thereupon the necessary forth-leaping of the second. If we throw a ball and recognise the naturalness with which it springs from the hand in the direction of effort, if we witness an avalanche and feel, as it were, the movement gathering speed, the rush, and the massive thunderous impact crushing obstacles below, in each instance we may fully see the truth of Hume's analysis. They are cases of lawful sequence. Sensible or imagined "force", all the familiar *qualia* accompanying physical compulsion, are part of the content of the successive facts, not part of the relation of dependence of the later on the earlier. We are slow to discern the penetrating truth of the analysis because of the relative feebleness in the human mind of the analytical imagination, the power of fitting the simpler parts together unerringly and realising that, thus conjoined, they are identical with the whole. And in especial because we have not tried to analyse the term necessity. The words that express mere succession we have never been wont to use for causation, we have reserved them for cases contrasted with it. "Mere succession" has meant "*not* cause and effect", it has been attached to casual and variable successions. A sequence that, once the antecedent is given, takes place unconditionally, that is, "cannot but" take place, is still however just a succession. Philosophers have been energetically opposing to the idea of unconditional sequence—the idea of unconditional sequence; for (once again) there was nothing else at their disposal. It merely went under another name. It has been in their imagination merely a se-

quence more tightly consecutive, more a matter of course. The series of events streamed forth as out of a sluice, with a more impetuous flow than these minds associated with " mere sequence ". It was this sense of lively and continuous process, of the inevitable rush of succeeding facts, it was the keenly felt fatality of transition that they missed in Hume's dissecting formulas. They were led astray by the association of words. Considered as a forcible characterisation of the mental impression that the activities of nature make upon us most of Hume's phrases are of course infelicitous. He was not talking about that. So we are told that he denied " causality ", or that " if causal propositions are taken as asserting a genuine necessary connection between events ", then, according to Hume, " there are no true causal propositions ". But what Hume did in effect was merely to bring out clearly one logical aspect of genuine necessary connection which had been blurred by the vagueness of an immature philosophical language.

Suppose we should adopt (as we saw in the first article that we cannot do) Kant's theory that to perceive an event at all we must conceive it as having a place in something like a machinery of events, as being a change in a substance and with a cause. That would exclude the view here maintained that we learn the law, the necessity, and the very idea of cause and effect from experience ; but Hume's account of the idea of cause and effect itself, his account of what it consists in, would remain in its fundamental feature untouched. There would still be nothing within the nature of the particular cause taken by itself to necessitate the effect. The necessity would arise, together with the law, as an indispensable assumption, quite distinct from anything in the intrinsic nature of the cause, just as by Hume's account it arises purely from experience. Kant's whole ingenious attempt confesses this ; it is because the necessity, he feels, is there and yet cannot be found in the cause or in experience, that we must conclude it to be contributed by the perceiving mind. And when we do what he did not, analyse closely the idea of necessity, we see that it must be derived from the law, which on his view is presupposed and on our own is learned through experience. We see that on his premises it would have to be simply the law which was contributed by the perceiving mind. Thus even by his conception, when explored to the bottom, there could in the end be nothing in causation but a sure sequence, which would carry necessity with it.

Suppose a world in which one occurrence is in fact merely the occasion of another, a world of invariable sequences such as Hume

conceives. In that world we should become aware that certain volitions would be promptly followed by certain bodily motions and these motions by motions of the matter with which our bodies were in contact. We should find that our volitions were the occasion upon which events followed that were followed in turn by events in which we took interest. If language were evolved it would contain words to designate such a series, distinguishing it from a series which did not repeat itself and so could not be counted upon. The distinction is practically the most vital of all distinctions and could not fail to be expressed. A word of this order would stand for a motion or volition thought of as reliably a forerunner of something else. But this world is our world and the terms in question are the verbs of action.

We are now in a position to confront the question that we supposed to arise at an earlier point: "Do you actually mean that there is no reason in things for the activities they display, no ground in the being of the world for the operations or sequences that go on in it, that its history is nothing but a series of inexplicable happenings, of sourceless upstartings? Such an analysis utterly denies its rationality."

What comment could be more natural? It expresses the strangeness that radical analysis, set forth in any language at our disposal, must wear to the unpractised mind. The comment has therefore all the mark of the deep-seated human repugnance to such analysis, namely, that the object of the repugnance is not completely understood, that in the objector's mind the process has never been quite carried through. It is repulsive because it has stuck fast half-way. Hence the terms to be analysed are turned against the analysis to reduce it to paradoxical absurdity, as if after it was all over they still must look as simple and ultimate as ever, and we had no right to proceed as if they were otherwise. When we suggest in what the relation consists between a consequent and its ground, this state of mind says, "Yes, but what is the ground of this relation?" When we try to point out the elements that constitute explanation, it interposes, "But surely there must be some explanation of why explanation explains". It is as if when you point out the component parts of the locomotive engine and how, working together, they give it its locomotive power, this objector should say, like the peasants of long ago in the German story, "Yes, yes, I understand, but there's a horse inside, isn't there?"

All assignment of reasons or grounds for events, that is, all explanation of them, presupposes an ultimate order of events. The idea of explaining is the idea of finding the law in a par-

ticular happening, that is, of finding that the happening is an instance of the law ; of seeing the two, law and particular happening, in coincidence. Hence to speak of explaining a basic law is to utter a contradiction in terms. It would mean seeing it as in coincidence with an ulterior law, and we have just said, in the word " basic ", that there is no ulterior law. We can intelligibly be asked to explain any sequence of happenings provided it is not the ultimate and lawful order from which alone explanation can be derived. It cannot be explained because any explanation must itself rest upon it. If it should be said that this order may itself at some future day be explained, that would only mean that it might be discovered that this was not the ultimate order. The existence of an ultimate order is referred to and taken for granted in the very idea of explanation and is the very thing that makes explanation possible in the world.

That there should be " a ground in the being of the world for the operations that go on in it "—this supposes that, to satisfy our minds, there should be just one ultimate in the matter, namely, the nature of the substance of which the world is composed ; so that we might, had we perfect knowledge, read off from this substance, taken as a whole, all the activities it would display. Now what Hume has enabled us to see is that to understand process we have to examine process, it is not sufficient to examine substance. We cannot find the explanation of what takes place in the universe by scrutinising a temporal cross-section of the universe by itself (to ignore for the moment the relativity of time). Explanation has to do with process and the secret of this is not contained within substance. Thus it is not the latter alone which is ultimate, but substance and process.

The objectors accept substance in the world as an ultimate fact, simply because it is thrust upon us in perception. But once thus accepted, they are not content that anything else should seem to be ultimate, they wish events to be merely the unfolding of substance. We must open our eyes, however, to the truth that just as truly as we take substance from experience so we take process from experience, and that they are equally ultimate.

There is, however, a proper and usual sense in which we may indeed say that the activities of things can be explained by the nature of those things, namely, when we include in their " nature " their properties, that is, the law of their behaviour and of the behaviour they occasion in other objects. And this, as already seen, is the way we are accustomed to speak. *Now* the activities of substance are merely the unfolding of its nature. *Now* there is a ground in the being of the universe for the operations

that go on in it, and there is a parent source for all happenings. This is a just and normal way of expressing the position. Thus it is that we have come to that habit of speech and that expectation as to speech from which the objection before us takes its origin. Curiously enough the objector is recognising process and its laws as ultimate without knowing it, by taking them as ultimate and obvious properties of things. For no thought can literally identify the future doings and transformations of an object with its present momentary state in which it is not thus doing and being transformed, and to speak as we do is merely to couple them in one composite idea which we have ordinarily no occasion to stop and take apart. When we declare that its activities follow from its nature we are in truth regarding its nature as partly present substance and partly its habits of behaviour not now being enacted. But it is most natural to forget that these are the facts, not to see at once that this is the proper way to put it, because we have not performed the analysis. It is the most natural of slips because the elementary laws of the action of matter are so constantly assumed without mention or attention. In other words, it is natural in our deliberate expression, our conscious formulas, to forget the laws, precisely because they are always there and we so automatically rely upon them.

Thus the whole objection before us arises from the very way of thinking that it assails and misdescribes. It is misbegotten from that way of thinking because it does not take account of the component parts of its own thought, because it has not carried the analysis through to the end. We all of us are assuming every day a universe in which things and the habitual behaviour of things are equally final facts, which we view together as supremely natural and as our standard for estimating naturalness.

But, says the objection, such an analysis utterly denies the rationality of the universe. It appears that this rationality can be secured only if all events are deducible from the nature of substance taken strictly in itself—a demonstrably untenable conception in which some philosophers have entangled themselves through a confusion of terms and of ideas. The universe can retain its " rationality " (to this it comes in the end) only if we do our thinking irrationally. But (it cannot too firmly be said and repeated) it is not the business of the universe to be rational, it is our business to be rational; and our rationality in thinking of the universe, or of any part or aspect of it, consists in doing our best to think of it as it is, and not as we " demand " that it shall be. Our rationality is exercised in just expectation and

explanation, and these depend wholly on an order *de facto* of which we learn only through experience. Nor are there any requirements or proprieties of thought in conceiving this order except those that experience discloses. We have no reason to think that the world will fly apart because it is not held together by deductive logic. Hume's account does not "take the linch-pin out of the universe", but only the confusion out of the philosophical mind.

II.

We turn now to our final question, also a question of rationality; whether Hume's view of causation renders impossible any intellectually valid basis for induction (as he himself held that it did) and thus issues in scepticism as to its validity.

Let the problem be definite for us at the outset. If induction cannot be derived from implications found in particulars, no more can it be derived from any other source distinct from the repetition of particulars. It is curious how much there is in the present atmosphere of philosophy to veil and soften the fact that it is only experience that can cast even the partial light of probability on the future. In the calculation of probabilities, for example, it seems to the hasty student that we are extracting by mathematical, that is, deductive methods, some degree of real knowledge from the mere possibilities of a situation; that we are extracting probability from possibility, which is another idea not containing it. This would be conjurer's work and it is (most unconsciously) by the conjurer's method of distracting attention from the vital point that the illusion is produced. This is strangely true even in the barest, the most well-worn cases. If we are reckoning the likelihood that in throwing dice a particular combination will result, or stating the chance of a horse in a coming race, the vital premise is that the dice will be thrown or the race run. In a purely hypothetical problem this is assumed; in a real forecast it is the probability on which of course everything rests. Something whose general nature we can state is with a high probability going to happen; there are, however, several modes in which it may happen, and we have no knowledge (let us say) that one is more likely than another. Each of them then has its share of the original, the general probability. Thus we are not working with mere possibilities, which would never yield any probability at all, but with probabilities each of a low degree. We believe that the possible modes in which the event may occur are limited in number. Indeed when we speak of "the possibilities

of a situation " we quite commonly mean to include the restriction of those possibilities, how far they go, which restriction is not itself a mere possibility at all, but a piece of positive fact. And we deem it unlikely, also on grounds of experience, that the dice will change their spots or be multiplied in the box or that instead of settling on one side they will balance on a corner or float in the air. It is the limitation of the possibilities, and the probability of the event of which they are merely possible forms, which are the basis of our operation. It is because these are tacitly and rapidly taken for granted and all the attention given to subsequent processes that the illusion arises. (And it has tended to be confirmed by the dismissal of certain false empirical explanations of the subsequent processes.) In any case whatever of such calculation, where some species of likelihood, however general, is given in the conclusions, it is found to accrue from experience. The invaluable function of the mathematics has been to analyse it adequately.

Mathematical truths and mathematical reasoning in general, it must not be forgotten, are explicative or analytic, not ampliative. That nature is an apt subject for such reasoning we discover solely by experience. We discover quantities in nature, and the constancy of certain quantities, and the constancy of proportion between certain varying quantities. This need not have been so, but so we find it. Hence calculation becomes useful. If mathematical reasoning is an explication of the meaning of our terms, how is it that we come to unforeseen results? Surely for the same reason that calculation exists at all; because the human mind cannot take in the meaning of mathematical symbols at any one moment except in the case of the very smallest and simplest quantities. It can realise twice two but it cannot realise 387 times 19. Yet the meanings as potential conceptions are duly fixed by definition. We cannot take them in, either in terms of objects of sense or in terms of the properties of numbers. If we say " thirteen " even, we have not in mind at once all the units and relations that the term involves, though owing to our remembered rules of reckoning we can proceed to work with it, or answer questions about it, correctly. In calculating we put together symbols and then handle them by remembered rules. It is like a trained workman manipulating a great machine whose inner construction he does not grasp. If we could realise 387 times 19 as we realise twice two (it is a mere matter of degree and there is nothing to prevent it but the sorely restricted accommodations and slow service offered by the human brain), we should not have to work it out by rule

and come to an unforeseen result. Reckoning is a means to a progressive (though in any instant partial) realization of the defined meaning of the initial terms. And the warrant for each step lies in the defined meaning of the terms there used. (Frege remarks that in mathematical reasoning we put together items of knowledge or conception that were separate before and that this new combination is what leads to new results. But this forgets that at the outset of our reasoning the appearance of our materials in separate symbols or formulas is a mere matter of the conventions of mathematical expression, and that a mind of sufficient capacity would at once grasp them jointly and in all their implied relations.) Mathematical reasoning is thus upon one side a pathetic witness to the weakness and littleness of the human mind.

Those who seek to base induction upon purely "rational" considerations, though they may seem not to run afoul of our principle as to implication, are in any case trying to break through another iron law, that no universal synthetic proposition, even as to probability, can be proved by deductive processes without assuming some universal synthetic proposition not thus proved. In other words, the characteristic and familiar bottomlessness of all deduction. This law is itself an analytical proposition. Deductive processes are explicative of the content of universals, hence we cannot get at any truth about concrete facts by these processes unless we load them with truths about concrete facts (by assumption or purely inductive conclusion) at the outset or on the way. If you cannot extract implications from concrete facts, no more can you extract concrete facts from universals. It is not the least puzzling problem in the subject how distinguished experts in logic can be tempted to imagine otherwise. Why should so stupendous and decisive a condition of the whole matter be rather shuffled toward the side? They will demonstrate their thesis triumphantly by sheerest ratiocination—granted merely that they may avail themselves by the way of a slight convenient assumption here or there about the future, something so natural and incidental or so in keeping with the present ideas of science (science, the foundations of which are the thing in question) that you surely, were it only out of common amenity and obligingness, or desire to keep your ideas up to date, will not deny it to them. Mr. Keynes in his *Treatise on Probability* not only tolerates assumptions but has a peculiarly winsome expression about them, "the validity of assuming".[1]

[1] *Treatise*, 263.

Those who grudge assumptions are still more disappointed at the result. Mr. Russell writes: . . . " while I am convinced that a justification [of inductive probability on rational grounds] is possible, I am not satisfied with those put forward by others or with any that I have been able to invent myself ". Again: " I am convinced that induction must have validity of some kind in some degree, but the problem of showing how or why it can be valid remains unsolved. Until it is solved, the rational man will doubt whether his food will nourish him, and whether the sun will rise to-morrow. I am not a rational man in this sense, but for the moment I shall pretend to be." [1] These words are quoted because behind their admirable bluntness we can so distinctly perceive their philosophic presupposition, which is in no sense peculiar to Mr. Russell but typical of our age; which every one of us who cultivates philosophy is heir to: " rational " for him means explicative, deductive. Hume considered that the inference from mere experience is irrational on the same ground, that it is not deductive, and hence he called his results sceptical.

This is a conclusion at which we may well look closely because of its singular consequence. Most of what is invoked as reason against the false steps that bring misery in families, institutions, communities, most of what is anxiously looked for in each life as reason where the need of it presses, hurts, and kills, consists in that very inference from experience which, unless some justification now hidden is forthcoming, our philosophy has pronounced irrational. The doctor, the administrator, the statesman do not crave deductive corroboration. That is the craving of the modern philosopher, victim of an all-powerful tradition and a long, long preoccupation with the fascinating mechanism of verbal inference and mathematics. He is looking into all manner of recondite corners for some missing portion of that mechanism which will alone, when found, confer validity on the whole procedure of human intelligence. It is the philosopher who in the practical realm where our utmost wits must painfully seek to tell good reasons from bad informs us that they are all bad reasons.

All the thinkers who in argument condemn our actual inference from concrete facts of experience as invalid, none the less, like Mr. Russell, deem it all the while valid. To hold it true and trusty is to hold it valid. They are not less sincere in matters of life or death than in the moments of their philosophical deliverance. This comment causes impatience; there comes the

[1] *Outline of Philosophy*, 14.

inevitable reply, "Oh! I can't help following my instincts of course, but I don't find any philosophical reasons for doing so". Let us waive for the moment the word "philosophical"; what we are concerned for is the truth. Is it really probable that a motor-car will strike you and run over you if you do not dart out of the way? In plain fact every one, if he bears his inmost mind to his scrutiny, is bound to confess that he does believe empirical inference capable of yielding a genuine and high probability. He cannot believe it and not believe it at the same time.

Hume explains conclusions from experience as a consequence of custom, of repetition. This is of course true, but it is psychology merely. When we reason from past and present facts, we look upon them as *grounds* for our conclusions, as *indicating* other fact, as constituting valid premises for reasoning of this nature. We do not regard the inference as deductive, we bother our heads about such conceptions not at all, we regard it as resting on concrete facts and yet as valid.

In these reasonings no inductive first principle appears. What we have is not a principle but a procedure, that of inferring concrete fact from fact and general truth from fact. However, our reasonings may err, we may find that something has not fallen out as we carelessly inferred that it would. Then it is that we perchance try to state to ourselves the circumstances in general under which such inferences are trustworthy. And when we are led to put this in the most general form we have unearthed the inductive first principle,—something we have not conceived before, but now see to be the proposition that states when our inferences from the concrete are safe and when they are not; a proposition which must take the form that under such and such conditions certain concrete conclusions follow. This will be the primal principle of induction, not assuming the law of causation, but being the means of establishing it. A vigilant procedure may be just as truly and efficiently ultimate for the mind as a principle—or just as truly and for the most part more efficiently ultimate; but the principle exhibits the scope of our procedure and supplies a definite rule to guide our vigilance..

Now according to a widely prevailing state of mind in the philosophy of our day it would be a profound intellectual relief and satisfaction if we could really find some demonstrative proof that this fundamental proposition is valid. A deductive, that is, an analytical, proof of a synthesis. A discovery of future facts in the bosom of past or present facts. The news that one of two distinct and separate things is an integral part of the other. This is yearning for a contradiction in terms. For the want of

this triumph of rationality philosophers are ready intellectually to abase themselves and be called in their daily life, even at its shrewdest and most sagacious, the irrational creatures of instinct. If we desire something by which to gauge the weight of the tradition in logic that lies upon our minds and holds them pinned in their old places, here we have it. A Greco-Scholastic tradition of deductivism as the ideal of rationality, in our day accidentally (so to speak) reinforced by the advances of mathematical logic.

Will it be said that all we need is to find a first principle self-guaranteed, self-evident? But identical or explicative propositions alone are self-evident; as A is A, or Green trees are green. They are self-evident only because they do not venture to add anything to their subjects, they are unreal predication, remaining within the definition of the subject, hence being literally indisputable, and hence also conveying no information to one who realizes the meaning of that definition. Any fundamental proposition which thus accorded with the deductivist's ideal would give no information and no assistance. This is again the principle with which we started in these articles: Implication can never carry us to fresh fact. It is not a disadvantage in the inductive first principle that it is not self-evident, for self-evidency excludes synthesis, that is, knowledge.

Nor does it help us to say that we "postulate" the first principle of induction, for that only means that we proceed as if it were true but do not know how to prove that it is so. Why do we happen to postulate that which is the basis of all our daily behaviour? Because we in fact believe it. That then,—not the ceremony of postulating,—is basal.

It is clear then that the deductivist's mode of dealing with the problem leaves it for him insoluble. By the nature of his scheme—obviously a true scheme, so far as it goes—first principles appear in the same relation to proof as do other propositions, that is, they call for it; but unfortunately, being "first", they cannot receive it. The device of trying to roll up the proof and the conclusion in one, of trying to find them self-evident, turns out to have no relevancy, and even no meaning, as applied to real first principles. May there not be something omitted in his analysis, something which has to do with the nature of first principles or ultimate procedure as basis?

What is overlooked is the position of reason, the standpoint from which it looks out upon the matters with which it has to deal. Reason is of the mind and the mind is a theatre of appearances of fact. These may be particular or they may be general. They may conflict, may cast suspicion one upon another and call

for a test of true appearance, and if any do not sustain this test they will cease to be appearances of fact or become fainter appearances of it. Apparent facts are challenged only on the strength of some other apparent fact. To say that each appearance is held veracious until grounds appear for judging it doubtful is only to say that it is really an appearance of fact. An appearance of fact in a logical vacuum is authoritative. What we call acceptance is the appearance itself and what we call rejection or doubt is the eclipse or dimming of it by another and conflicting one. At each stage the only pertinent question is, What is now the appearance of things? Take away all apparent fact, particular and general, and you have neither belief, disbelief, rational doubt, nor reason itself. The question remains, What are the ultimate, the unsuperseded appearances? If we say that these also must be tested and corroborated, we are confused. Tested and corroborated by what? The principle that they must be tested, and the principle which is the test, would have to be other appearances which, since those in question are subject to their decision, must be ulterior to the ultimate. Accordingly, the final apparent fact is subject to no test, which is only to say that here is in the eyes of reason an unchallenged appearance of fact. It is in a logical vacuum. All proof or substantiation of fact rests by its very essence on ultimate appearance and furnishes no guaranty not derived therefrom.

The principle that the way in which things happen helps us to foresee how they will happen is an ultimate appearance of fact. (We need not stay upon the question of the precise form to be taken by the principle of inference from concrete situations, for though not essentially puzzling it would require another article.) The principle that appearances are untrustworthy until they are proved is an appearance of fact based upon this ultimate appearance. *It is a generalization from experience.* The existence of an appearance of fact, so far as it goes, is consistent with there existing a state of things of which that appearance is not true, but this consistency says nothing of any probability, however slight, that it is not true, or even of such a possibility. For possibility in the usual sense of the word involves the absence of a certainty to the contrary. Once again, the consistency of the existence of any appearance with its falsity is not a probability that it is false nor a proof that it is not certainly true; it says in itself nothing about these questions. Hence our principle that propositions are to be under suspicion until proved true rests solely on our experience of life, which does not show this with respect to all propositions, for instance, the principle by which we reason

from experience. It remains therefore an unchallenged appearance of fact.

To state the same in other words, our acceptance of the empirical principle is an ultimate belief. If we believe something, and our belief is not conditioned upon some other belief that may come into question, that is, if to us the object or relation is simply fact, rationality requires us to act and think accordingly. It would be curiously irrational and absurd to go in quest of proofs for that which already has for us the status of solid fact. No proof could make it in our eyes better than fact. And reason has no occasion to be restive and self-tormenting in this position, since there is no canon of judgement that condemns or reflects upon it. Just as the explanation of fact brings us to the ultimate, so does the substantiation of fact.

There could be no more favourable situation for a first principle, if it is really first, than the following; (1) that it is an appearance of fact, (2) that there is on the horizon no reason whatsoever for doubting its truth, (3) that it is itself the standard for judging of all other professed fact, (4) that according to the appearance there is a world whose workings would produce in the mind such an appearance as this is. The last circumstance, that the appearance is justified of its children, is not evidential of course, evidence being irrelevant to the case; it is the fact of entire logical harmony in the appearing world.

It is of the very nature of knowledge that the ultimate synthesis should convey itself simply by appearance to the mind. It cannot be certificated. This leaves the deductivist unsatisfied because it has mental force only and not communicable, public force. He has been estranged from the fact that knowledge is of the mind. Deductive logic arose from discussion, from the social interchange of ideas, it dealt with the transferable symbols of language, it expressed itself by the challenge, "How is that proved?" It has drifted into the assumption that all rational foundations are communicable. In the absence of proof it "postulates"—a part of the punctilio of exposition and debate. The deductivist's is the forensic conception of knowledge. But it is the mental, not the forensic, point of view which is ultimate. The very existence of other minds is an inference from the principle under which we reason from experience. Nothing but a discovered common possession of ideas and of fundamental beliefs makes the interchange of reasons possible. If we express an ultimate belief in the forensic fashion as a "proposition" we have omitted its status for that human reason to which that which is believed is, in one significant use of the term, an ultimate datum.

By reason do we not mean the discernment of cogency, or the power of discerning cogency ? This has two forms, analytic and synthetic, that is to say, deductive and inductive. Reason is the perception of implication, but it is also the perception of indication. And for criticism the general expression of indication is a principle which ultimately—beyond and above any grounded doubt—appears valid. This is the principle of synthetic reason itself. To proceed in accordance with it is what we mean, in dealing with facts, by rationality. The historic antithesis between rationalism and empiricism is ill-founded. In the effort of developing in all its forms what has been at once a most potent instrument and a splendid toy, deductive logic, philosophy has somewhat warped its faculties ; speaking according to the literal sense of the words, its reason has become unbalanced.

Thus we see that Hume's doctrine of the nature of cause need bring us to no sceptical conclusions as to the validity of induction. This doctrine was in its inner meaning an analysis, pure and simple, and his only essential error lay in not approaching induction also as an occasion for analysis instead of scepticism. The problem of justification or guarantee is itself first of all an analytic problem. What is the nature of inference from experience ? What is the nature of its standards ? What is the nature of guaranty in relation to these standards ? What then are the standards of judgement that hold good in the matter for the spirit of rational scepticism ? These were the questions to which his inquiry had really to address itself and to which, had he followed the method that at least underlies his treatment of causation, he had the material for complete answer.

II.—THE PRINCIPLES OF DEMONSTRATIVE INDUCTION (II.).

By C. D. Broad.

7. Laws of Correlated Variation of Determinates.—We have now completed our account of the arguments by which one attempts to establish laws of *Conjunction of Determinables*. Suppose that we have thus rendered it highly probable that $C_1 \ldots C_n$ is a S.S.C. of E, where E may itself be a complex characteristic of the form $E_1 \ldots E_m$. We now want to go further and to consider the connexion between various determinate values of $C_1 \ldots C_n$, on the one hand, and various determinate values of E, on the other. This is what Mr. Johnson seeks to formulate in his inductive methods. For this purpose we need some further postulates in addition to those which we used in the theory of necessary and sufficient conditions. We will begin by stating and commenting on these postulates.

Postulates.—(3) If C be a S.S.C. of E, and if there is at least one instance in which a certain determinate value c of C is accompanied by a certain determinate value e of E, then in *every* instance in which C has the value c E will have the value e. (We will call this *Postulate* 3, as we have already had two postulates.)

I will now make some comments on this postulate. (*a*) The converse of it is not assumed to hold. Our postulate states that c cannot be accompanied in some instances by e and in other instances by e'. But it does not deny that e may be accompanied in some cases by c and in others by c'. The point will be made clear by an example. Let E be the time of vibration of a compass-needle free to vibrate about its point of suspension in a magnetic field. Then the S.S.C. of E is a conjunction of three factors, *viz.*, the moment of inertia of the needle, its magnetic moment, and the intensity of the magnetic field. Call these three factors C_1, C_2, and C_3 respectively. Then the causal formula is in fact $E = 2\pi\sqrt{C_1/C_2C_3}$. It is plain that, if determinate values of C_1, C_2, and C_3 be taken, any repetition of them all will involve a repetition of the original value of E. But the original value of

E might occur when the values of C_1, C_2, and C_3 were different from their original values, provided the new values were suitably related among themselves.

(*b*) It will be noticed that the postulate is of the form required for the major premise of a demonstrative induction. For it is a hypothetical proposition in which the consequent is a universal categorical, and the antecedent is a particular categorical of the same quality and with the same subject and predicate as the consequent.

(*c*) In virtue of this postulate we can talk of *the* value of E which corresponds to a given value of C. But we cannot talk of *the* value of C which corresponds to a given value of E, since there may be several such values. Thus the postulate may be said to deny the possibility of a plurality of determinate total effects to a given determinate total cause, but to allow of a plurality of determinate total causes to a given determinate total effect. I propose to call this postulate the " Postulate of the *Uniqueness of the Determinate Total Effect.*"

(*d*) It must be clearly understood that, although in stating the postulate the single letters C and E have been used, they are meant to cover the case of conjunctions of factors, such as $C_1 \ldots C_n$ and $E_1 \ldots E_m$. In such cases the determinate *c* will represent the conjunction of a certain determinate value of C_1 with a certain determinate value of C_2 with . . . a certain determinate value of C_n. And similar remarks apply, *mutatis mutandis*, to *e*. Thus we shall have a different determinate value of C if we have a different determinate value of *at least one* of the determinables $C_1 \ldots C_n$, even though we have the same determinate values as before for all the other C-factors. And similar remarks apply, *mutatis mutandis*, to variations in the determinate value of E.

(4) This brings us to the fourth postulate. It runs as follows. If a total cause or a total effect be a conjunction of several determinables it is assumed that no determinate value of any of these factors either entails or excludes any determinate value of any of the other factors in this total cause or total effect. This may be called the " Postulate of *Variational Independence* ". It should be compared with Postulate (1), which we called the postulate of *Conjunctive Independence.*

Now suppose that E is a conjunction of the determinables $E_1 \ldots E_m$. Let there be μ_1 determinates under E_1, μ_2 determinates under E_2, . . . and μ_m determinates under E_m. It follows from the Postulate of Variational Independence that the total number of different determinate values of E will be $\mu_1 \mu_2 \ldots \mu_m$. Let us call this the " *Range of Variation* " of E. Now it

follows at once from the Postulate of the Uniqueness of the Determinate Total Effect that, if C be a S.S.C. of E, the range of variation of C cannot be narrower than the range of variation of E, though it may be wider. For to every different determinate value of E there must correspond a different determinate value of C, whilst several different determinate values of C may correspond to one and the same determinate value of E. Suppose that C is a conjunction of the determinables $C_1 \ldots C_n$. Let there be ν_1 determinates under C_1, ν_2 determinates under $C_2 \ldots$ and ν_n determinates under C_n. Then the range of variation of C is $\nu_1\nu_2 \ldots \nu_n$. And the principle which we have just proved is that $\nu_1\nu_2 \ldots \nu_n \geqslant \mu_1\mu_2 \ldots \mu_m$.

Now two different cases are possible. (*a*) Every determinable in E may have only a finite number of determinates under it. This alternative leads to nothing of great interest. (*b*) At least one of the determinables in E may have an infinite number of determinates under it. If so, the range of variation of E will be infinite. Consequently the range of variation of C must be infinite. But this will be secured if and only if at least one of the determinables in C has an infinite number of determinates under it. So we reach the general principle that if there is at least one factor in a total effect which has an infinite number of determinates under it then there must be at least one factor in any S.S.C. of this effect which has an infinite number of determinates under it.

We can now go rather further into detail by using the elements of Cantor's theory of transfinite cardinals. (*a*) Even if *all* the determinables in a total effect should have an infinite number of determinates under them it will be sufficient that *at least one* of the determinables in the total cause should have an infinite number of determinates under it. For the number of determinables in the total effect is assumed to be finite. Consequently the range of variation of the total effect will be an infinite cardinal raised to a finite power, even in the case supposed. Now it is known that any finite power of an infinite cardinal is equal to that infinite cardinal. Therefore it is enough, even in the case supposed, that at least one of the determinables in the total cause should have an infinite number of determinates under it. We can sum up our results in the form: "If *at least one* factor in the total effect has an infinite number of determinates under it it is *necessary* that at least one factor in the total cause should have an infinite number of determinates under it; and even if *all* the factors in the total effect have an infinite number of determinates under them it is *sufficient* that at least one of the factors in the total cause should have an infinite number of determinates under

it". (*b*) If the number of determinates under one of the determinables in E be infinite there are still two possible alternatives. In the first place the series of determinates may merely be "compact", *i.e.*, it may merely be the case that there is a determinate of the series between any pair of determinates of the series. If so, it has the same cardinal number as the series of finite integers, *viz.* $\aleph_0$ the smallest of the transfinite cardinals. On the other hand, the series of determinates under this determinable may be "continuous" in the technical sense, as the points on a straight line are supposed to be. If so, it has the same cardinal number as the series of real numbers, *viz.*, $2^{\aleph_0}$. Now it is known that $2^{\aleph_0}$ is greater than $\aleph_0$. We can therefore enunciate the following general principle: "If any of the determinables in a total effect has under it a series of determinates which is strictly 'continuous' then at least one of the determinables in the total cause must have under it a series of determinates which is not merely 'compact' but is strictly 'continuous'."

Before leaving this subject there is one final question that might be raised. Is it possible that one or more of the determinables in a *total cause* should have an *infinite* number of determinates under it whilst all the determinables in the *total effect* have only a *finite* number of determinates under them? There is certainly nothing in any of our postulates to rule out this possibility. It would be realised if, *e.g.*, the following state of affairs existed. Suppose that C is a total cause and that E is its total effect. Suppose that E has a finite number of determinate values e_1, e_2, etc. Suppose that the determinate values of C form a compact or a continuous series. And suppose finally that c_0 and every value of C between c_0 and c_1 determines the value e_1 of E, that c_1 and every value of C between c_1 and c_2 determines the value e_2 of E, and so on. I do not see anything impossible in a law of this kind, though I do not know of any quite convincing example of such laws. The following would be at least a plausible example. Suppose we take the three possible states of a chemical substance, such as water, *viz.*, the solid, the liquid, and the gaseous, as three determinates under a determinable. And suppose we say that this determinable is a total effect of which the two determinables of pressure and temperature constitute a total cause. Keep the pressure fixed at 76 cm. of mercury, and imagine the temperature to be varied continuously. Then every determinate value up to a temperature of zero on the centigrade scale determines the solid state, every determinate value from zero up to 100° determines the liquid state, and every determinate value above 100° determines the gaseous state.

I have said that the above is a *plausible* example of a case in which the same determinate total effect has an infinite plurality of different possible determinate total causes. But, when it is more carefully inspected, it can be seen not to be a *real* example. The fact is that we have not got here either the genuine total cause or the genuine total effect. The real total cause is a conjunction of three factors, *viz.*, the pressure, P, the total mass of the substance, M, and the quantity of heat contained in the substance, H. The real total effect is a conjunction of four factors; *viz.*, S, the amount of the substance in the solid state; L, the amount of the substance in the liquid state; G, the amount of the substance in the gaseous state; and T, the temperature of the substance. Our law of the conjunction of determinables is then that PMH is a S.S.C. of SLGT. Suppose that at the beginning of the experiment all the water is in the solid form, and is at a temperature below freezing-point. We will keep the determinate values of P and M constant throughout the experiment at the values p and m. And we will continuously increase H. At first L and G will have the values 0, and S will have the value m. As H is increased these values will remain constant, but T will continuously increase. This will go on till T reaches the melting-point of ice at the pressure p. If we now further increase H the values of S and L will begin to change continuously, whilst the value of T will remain at the melting-point of ice under the pressure p. The value of S will steadily diminish and that of L will steadily increase until we reach a stage at which the value of S is 0 and the value of L is m; *i.e.*, all the water will now be in the liquid state at the temperature of melting ice under the pressure p. If we still go on increasing the value of H the values of T will now start to increase steadily, and this will go on till the liquid water reaches the boiling-point under the given pressure. If H be still increased after this point we shall have the values of L and G changing, whilst T remains constant. This stage will go on as we increase H until all the water is converted into steam at the temperature of boiling water under the pressure p. At this stage S and L will have the values 0, whilst G will have the value m. If more heat be now put in, S, L, and G will henceforth keep constant at 0, 0, and m, respectively, and T will steadily rise.

We see then that at every stage *some* factor in the *total* effect is varying continuously as the factor H in the total cause varies continuously, although other factors in the total effect may at the same time be keeping constant in value. Thus the *total effect* changes continuously in value throughout the whole process, and to each determinate value of it there corresponds one and only

one value of that factor in the total cause which is being continuously varied while the remaining cause-factors are kept constant. It is possible that, whenever it seems that a continuous set of different values of a total cause all determine the same value of a total effect, this is always due to our not having got the *total* cause and the *total* effect. But, although this may well be so, I do not see that there is any logical necessity that it should be so.

We come now to the remaining postulate of the correlated variation of determinates.

Before stating this postulate it will be convenient to introduce a certain notation which will enable us to formulate it briefly and clearly. Let us suppose that $C_1 \ldots C_n$ is a total cause of which E is the total effect. Consider a certain one factor in this total cause, *e.g.*, C_r. I propose to denote the conjunction of the remaining factors $C_1C_2 \ldots C_{r-1}C_{r+1} \ldots C_n$ by the single symbol Γ_{n-r}. The total cause can then be denoted by the symbol $C_r\Gamma_{n-r}$. Suppose now that a certain determinate value is assigned to each of the factors in Γ_{n-r}. We shall thus get a certain determinate value of Γ_{n-r}, and this may be denoted by γ^a_{n-r}. Let a certain determinate value of C_r be denoted by c^x_r. Then the determinate value of the total cause may be denoted by $c^x_r\gamma^a_{n-r}$. To this there will correspond a certain one determinate value of E. Let us denote this by $e^{x,\,a}_{r,\,n-r}$. We are now in a position to state our postulate.

(5) Let $C_1 \ldots C_n$ be a total cause of which E is the total effect. Select any one factor C_r from this, and assign to the remainder Γ_{n-r} any fixed value γ^a_{n-r}. Then, if there are *at least two* values of C_r, *e.g.*, c^x_r and c^y_r, which determine *different* values of E, *every* different value of C_r in combination with γ^a_{n-r} will determine a *different* value of E.

With the notation explained above the postulate can be stated very simply in the symbolism of *Principia Mathematica*. It will run as follows :—

$$(\exists x, y) \,.\, c^x_r \neq c^y_r \,.\, e^{x,\,a}_{r,\,n-r} \neq e^{y,\,a}_{r,\,n-r} : \supset_{a,\,r} : c^x_r \neq c^y_r \,.\, \supset_{x,\,y} \,.\, e^{x,\,a}_{r,\,n-r} \neq e^{y,\,a}_{r,\,n-r}.$$

Now there are two other propositions which are logically equivalent to this postulate. The first is reached by taking the contra-positive of Postulate 5. We will call it (5*a*). It runs as follows :—

(5*a*) Let $C_1 \ldots C_n$ be a total cause of which E is the total effect. Select any one factor C_r from this, and assign to the remainder Γ_{n-r} any fixed value γ^a_{n-r}. Then, if there are *at least*

two values of C_r, *e.g.*, c_r^x and c_r^y, which in combination with γ_{n-r}^a determine *the same* value of E, *every* value of C_r in combination with γ_{n-r}^a will determine *the same* value of E.

This can be put in the symbolism of *Principia Mathematica* as follows :—

$$(\exists x, y) \,.\, c_r^x \neq c_r^y \,.\, e_{r,n-r}^{x,a} = e_{r,n-r}^{y,a} : \supset_{a,r} : (x, y) \,.\, e_{r,n-r}^{x,a} = e_{r,n-r}^{y,a}.$$

The second logically equivalent form of Postulate 5 may be called (5*b*). It is reached by substituting for the original hypothetical proposition the equivalent denial of a certain conjunctive proposition, in accordance with the general principle that " if p then q " is equivalent to the denial of the conjunction " p and not-q ". It runs as follows :—

(5*b*) Let $C_1 \ldots C_n$ be a total cause of which E is the total effect. Select any one factor C_r from this, and assign to the remainder Γ_{n-r} any fixed value γ_{n-r}^a. Then it cannot be the case *both* that there is a pair of values of C_r which in combination with γ_{n-r}^a determine *different* values of E, *and also* that there is a pair of values of C_r which in combination with γ_{n-r}^a determine *the same* value of E. This can be symbolised as follows :—

$$\sim\{(\exists x, y) \,.\, c_r^x \neq c_r^y \,.\, e_{r,n-r}^{x,a} \neq e_{r,n-r}^{y,a} : (\exists x, y) \,.\, c_r^x \neq c_r^y \,.\, e_{r,n-r}^{x,a} = e_{r,n-r}^{y,a}\}.$$

I will now make some comments on this postulate. (*a*) It will be seen, on referring back to the first section of this paper, that (5) and (5*a*) are propositions of the form required to enable them to be used as major premises in demonstrative inductions. They are used as such by Mr. Johnson in his " *Figure of Difference* " and his " *Figure of Agreement* " respectively.

(*b*) It will be noticed that, when the conditions of (5) are fulfilled, not only is the *presence* of C_r relevant to the *presence* of E, but also the *variations* of C_r are relevant to the *variations* of E. Postulate 5 may therefore be called the " Postulate of *Variational Relevance* ". When the postulate is put in the equivalent form (5*a*), and the conditions are fulfilled, the presence of C_r is relevant to the presence of E, but the variations of C_r are irrelevant to the variations of E. So, in this form, it may be called the " Postulate of *Variational Irrelevance* ". An interesting example of variational irrelevance is furnished by Prof. H. B. Baker's discovery that gases which normally combine with explosive violence when a spark is passed through a mixture of them will not combine at all if they be completely dry. Thus the presence of *some* water is a necessary condition for any combination to take place in the assigned circumstances. But, granted that there is some

water present, no difference in the amount of it seems to make any appreciable difference to the completeness or the violence of the combination which takes place when a spark is passed through the mixed gases.

(*c*) It must of course be clearly understood that, when the conditions of (5) are fulfilled, it follows only that variations of C_r are relevant so long as Γ_{n-r} is kept fixed *at the value* γ^a_{n-r}. For other values of Γ_{n-r} variations in C_r might be irrelevant. Similarly, when the conditions of (5*a*) are fulfilled, it follows only that variations in C_r are irrelevant so long as Γ_{n-r} is kept fixed *at the value* γ^a_{n-r}. For other values of Γ_{n-r} variations in C_r might be relevant.

(*d*) Finally we come to the question: "Is this postulate true?" It seems to me quite certain that it is not. The fact is that Mr. Johnson, who first stated it, has altogether ignored the possibility of natural laws which take the form of periodic functions. Suppose there were a natural law of the form $E = C_1 \sin C_2$. Let C_1 be assigned a certain value. Take any value C_2^x of C_2. Then, for every value of C_2 that differs from this by an integral multiple of 2π, E will have the same value. On the other hand, for every value of C_2 which does not differ from this by an integral multiple of 2π, E will have a different value. Thus (5*b*) is directly contradicted. Nor is the kind of law which leads to these results at all fanciful. Such laws hold in electro-magnetism for alternating currents and the magnetic forces which depend on them. Thus the effect of the Postulate is to exclude all laws which take the form of periodic functions. And there is no *a priori* objection to such laws, whilst some important natural phenomena are in fact governed by laws of this kind.

It is worth while to remark that the existence of periodic laws answers in the affirmative a question which was raised and left unanswered in our comments on Postulate (4). The question was whether it is possible that a single determinate value of a total effect should correspond to an infinite plurality of alternative values of the total cause. In the case of periodic laws this possibility is realised. In our example, if C_1 be fixed, every one of the infinite class of values of C_2 which differ from each other by an integral multiple of 2π will determine one and the same value of E.

(8) Mr. Johnson's "Figures of Induction". It only remains to explain and exemplify Mr. Johnson's "Figures of Induction". These are based on Postulate (3), *i.e.*, the Postulate of the Uniqueness of the Determinate Total Effect, and on one

form or other of Postulate (5). The " Figure of Difference " uses this postulate in its first form, *i.e.*, in the form of the Postulate of Variational Relevance. The " Figure of Agreement " uses it in the second form (5*a*), *i.e.*, in the form of the Postulate of Variational Irrelevance. All the Figures also presuppose Postulate 4, *i.e.*, the Postulate of Variational Independence. And, since they all presuppose that a certain set of determinables has been shown to stand in the relation of total cause to a certain other set of determinables as total effect, they all presuppose the two postulates of Conjunctive Independence and of Smallest Sufficient Conditions. For these are involved in the arguments which are used in establishing laws of the Conjunction of Determinables. We will now consider the Figures in turn.

(i) *Figure of Difference.*—The premises are as follows :—

$C_1 \ldots C_n$ is a total cause of which E is the total effect. (*a*).

In a certain instance a certain determinate value $C_r^u \gamma_{n-r}^a$ is accompanied by a certain determinate value e of E. (*b*).

In a certain instance a certain determinate value $c_r^v \gamma_{n-r}^a$ is accompanied by a certain determinate value e' of E. (*c*).

c_r^u and c_r^v are different values of C_r; and e and e' are different values of E. (*d*).

The argument runs as follows :—

From (*a*), (*b*), and Postulate (3) it follows that *every* instance of $c_r^u \gamma_{n-r}^a$ is also an instance of e.

From (*a*), (*c*), and Postulate (3) it follows that *every* instance of $c_r^v \gamma_{n-r}^a$ is also an instance of e'.

From these conclusions, together with (*d*) and Postulate (5), the following conclusion results : " Corresponding to *each* value of $C_r \gamma_{n-r}^a$ there is a certain value of E, such that *every* instance of that value of $C_r \gamma_{n-r}^a$ is an instance of that value of E. And for *every* different value of $C_r \gamma_{n-r}^a$ the corresponding value of E is different." That is

$$c_r^x \neq c_r^y \cdot \supset_{x,\,y} \cdot e_{r,\,n-r}^{x,\,a} \neq e_{r,\,n-r}^{y,\,a}.$$

(ii) *Figure of Agreement.*—The premises are as follows :—

$C_1 \ldots C_n$ is a total cause of which E is the total effect. (*a*).

In a certain instance a certain determinate value $c_r^u \gamma_{n-r}^a$ is accompanied by a certain determinate value e of E. (*b*).

In a certain instance a certain determinate value $c_r^v \gamma_{n-r}^a$ is accompanied by the same determinate value e of E. (*c*).

c_r^u and c_r^v are different values of C_r. (*d*).

The argument runs as follows :—

From (*a*), (*b*), and Postulate (3) it follows that *every* instance of $c_r^y \gamma_{n-r}^a$ is also an instance of *e*.

From (*a*), (*c*), and Postulate (3) it follows that *every* instance of $c_r^v \gamma_{n-r}^a$ is also an instance of *e*.

From these conclusions, together with (*d*) and Postulate (5*a*), the following conclusion results : " Corresponding to *each* value of $C_r \gamma_{n-r}^a$ there is a certain value of E, such that *every* instance of that value of $C_r \gamma_{n-r}^a$ is an instance of that value of E. And for *every* value of $C_r \gamma_{n-r}^a$ the corresponding value of E is the same, *viz.*, *e*." That is

$$(x, y) \,.\, e_{r, n-r}^{x, a} = e_{r, n-r}^{y, a} = e.$$

I will now make some comments on these two figures. The important point to notice is that each makes a *double* generalisation by means of two different applications of demonstrative induction. The first generalises from a given *instance* of a given value to *all instances* of *that* value. This part of the argument rests on the Postulate of the Uniqueness of Determinate Total Effects. The second generalises from a given *pair of values* of a certain determinable cause-factor to *every pair of values* of that cause-factor. This part of the argument rests on the Postulate of Variational Relevance or Variational Irrelevance. The final result sums up both generalisations.

It may be remarked that, when we have the premises needed for the Figure of Agreement, we can reach a more determinate conclusion than when we have the premises needed for the Figure of Difference. In the former case we know the determinate value of E which will be present in every instance in which any value of C_r is combined with γ_{n-r}^a. In the latter case we know only that a different determinate value of E will be present for each different determinate value of C_r combined with γ_{n-r}^a. We do not know what value of E will be correlated with each different value of $C_r \gamma_{n-r}^a$. To discover this we need to use the methods of *Functional Induction ;* and this is a branch of *Problematic*, not of *Demonstrative*, Induction, and so falls outside the scope of this paper. Thus any complete inductive investigation begins and ends with Problematic Induction, and uses Demonstrative Induction only in its intermediate stages. It begins with Problematic Induction in order to establish Laws of the Conjunction of Determinables. In order to get these into the form of laws which express the relation of total cause to total effect it has to use the kind of deductive arguments which we considered in connexion

with Necessary and Sufficient Conditions. In order to discover which factors in the total cause are variationally relevant and which are variationally irrelevant it has to use Mr. Johnson's figures, or something equivalent to them. And, in order to discover the detailed functional relation between variations in the total cause and variations in the total effect, it has finally to resort to a form of Problematic Induction.

(iii) *Figure of Composition.*—The premises are as follows :—

$C_1 \ldots C_n$ is a total cause of which E is the total effect. (*a*).

In a certain instance a certain determinate value $C_r^u \gamma_{n-r}^a$ is accompanied by a certain determinate value e of E. (*b*).

In a certain instance a certain determinate value $c_r^v \gamma_{n-r}^a$ is accompanied by a certain determinate value e' of E. (*c*).

In a certain instance a certain determinate value $c_r^w \gamma_{n-r}^b$ is accompanied by a certain determinate value e of E. (*d*).

The three values of C_r are all different, and e' is different from e. (*e*).

The argument runs as follows :—

From (*a*), (*b*), and Postulate (3) it follows that *every* instance of $c_r^u \gamma_{n-r}^a$ is also an instance of e.

From (*a*), (*c*), and Postulate (3) it follows that *every* instance of $c_r^v \gamma_{n-r}^a$ is also an instance of e'.

From (*a*), (*d*), and Postulate (3) it follows that *every* instance of $c_r^w \gamma_{n-r}^b$ is also an instance of e.

Now it is impossible that γ_{n-r}^a should be the same as γ_{n-r}^b. For, if we first take (*b*) and (*d*) together, and then take either (*b*) and (*c*) together or (*c*) and (*d*) together, this would directly contradict Postulate (5*b*), in view of (*e*).

The final conclusion which results is this : " Corresponding to *every* different value of C_r which, in conjunction with some value of Γ_{n-r}, determines the same value e of E there is a different value of Γ_{n-r}. And, in *every* instance in which a certain value of C_r is present along with e and some value of Γ_{n-r}, Γ_{n-r} will be present in the value that corresponds to this value of C_r."

I must remark that Mr. Johnson's formulation of this figure at the bottom of page 225 of Part II. of his *Logic* seems to me quite unsatisfactory. He there mentions only two instantial premises, whilst it is quite evident from the verbal statement of the figure which he makes earlier on the same page that a third instantial premise is essential to distinguish this from the Figure of Difference.

We can carry the argument a step further if we now add the

premise (f) that γ^a_{n-r} and γ^b_{n-r} are known to differ *only* in the respect that a certain determinable C_s is present in the former in the value c^a_s and in the latter in the value c^b_s. In that case γ^a_{n-r} can be written as $c^a_s\gamma^\alpha_{n-r-s}$, and γ^b_{n-r} can be written as $c^b_s\gamma^\alpha_{n-r-s}$.

The final conclusion then runs as follows: "Corresponding to *every* different value of C_r which, in conjunction with γ^α_{n-r-s} and with some value of C_s, determines the same value e of E there is a different value of C_s. And, in *every* instance in which a certain value of C_r is present along with e and some value of C_s, C_s will be present in the value which corresponds to this value of C_r."

We may symbolise the value of E which is always present when $c^x_r c^a_s \gamma^\alpha_{n-r-s}$ is present by $e^{x,\,a,\,\alpha}_{r,\,s,\,n-r-s}$. The first clause of the above conclusion can then be symbolised as follows:—

$$c^x_r \neq c^y_r \,.\, e^{x,\,a,\,\alpha}_{r,\,s,\,n-r-s} = e^{y,\,b,\,\alpha}_{r,\,s,\,n-r-s} = e : \supset_{x,\,y} \,.\, c^a_s \neq c^b_s.$$

The first clause of the conclusion which we reached before adding the premise (f) may be symbolised as follows:—

$$c^x_r \neq c^y_r \,.\, e^{x,\,a}_{r,\,n-r} = e^{y,\,b}_{r,\,n-r} = e : \supset_{x,\,y} \,.\, \gamma^a_{n-r} \neq \gamma^b_{n-r}.$$

(iv) *Figure of Resolution.*—This figure is in a different position from the others. Here we have three observations which directly conflict with Postulate (5b) given the premise that $C_1 \ldots C_n$ is a total cause of which E is the total effect. It is evident that, in such a case, the only solution is to suppose that we were mistaken in believing that every factor in $C_1 \ldots C_n$ is simple. One at least of them must be a conjunction of at least two determinables, *e.g.*, K_1 and K_2. The kind of premises which would lead to this conclusion are the following:—

In a certain instance a certain determinate value $C^u_r\gamma^a_{n-r}$ is accompanied by a certain determinate value e of E. (b).

In a certain instance a certain determinate value $C^v_r\gamma^a_{n-r}$ is accompanied by a certain determinate value e' of E. (c).

In a certain instance a certain determinate value $C^w_r\gamma^a_{n-r}$ is accompanied by a certain determinate value e of E. (d).

c^u_r, c^v_r, and c^w_r are all different. And e' is different from e. (e).

It is evident that, if (b) and (d) be taken together, and if either (b) and (c) or (c) and (d) be taken together, there is a direct conflict with Postulate (5b). The only solution is to suppose that C_r is really a conjunction of two determinables, K_1 and K_2. In that case c^u_r may be k_1k_2, c^v_r may be $k_1'k_2'$, and c^w_r may be $k_1''k_2''$; and the contradiction will be avoided. It seems needless to pursue this into further detail.

Complete Symbolic Statement of the First Three Figures.—I will bring this paper to an end by giving a complete symbolisation for the premises and the conclusions of the first three of Mr. Johnson's figures. Mr. Johnson's own symbolism seems to me to be very inadequate. For the present purpose we shall need two further bits of symbolism. (i) I will symbolise the premise that $C_1 \ldots C_n$ is a total cause of which E is the total effect by $C_1 \ldots C_n \rightarrow E$. (ii) We need a symbol for the statement that x is an instance of a conjunction of characteristics, A, B, C . . . Z. I shall denote this by $[AB \ldots Z]x$. We are now in a position to deal with the figures of Difference, Agreement, and Composition.

Difference.

$C_1 \ldots C_n \rightarrow E \quad (a)$

$[c_r^u \gamma_{n-r}^a e] p \quad (b)$

$\therefore [c_r^u \gamma_{n-r}^a] \xi \supset_\xi [e] \xi$ (by Postulate 3)

$[c_r^v \gamma_{n-r}^a e'] q \quad (c)$

$\therefore [c_r^v \gamma_{n-r}^a] \xi \supset_\xi [e'] \xi$ (by Postulate 3)

$c_r^u \neq c_r^v . e \neq e' \quad (d)$

$\therefore c_r^x \neq c_r^y . \supset_{x,y} . e_{r,n-r}^{x,a} \neq e_{r,n-r}^{y,a} : [c_r^x \gamma_{n-r}^a] \xi \supset_{\xi,x} [e_{r,n-r}^{x,a}] \xi$ (by Postulate 5).

Agreement.

$C_1 \ldots C_n \rightarrow E \quad (a)$

$[c_r^u \gamma_{n-r}^a e] p \quad (b)$

$\therefore [c_r^u \gamma_{n-r}^a] \xi \supset_\xi [e] \xi$ (by Postulate 3)

$[c_r^v \gamma_{n-r}^a e] q \quad (c)$

$\therefore [c_r^v \gamma_{n-r}^a] \xi \supset_\xi [e] \xi$ (by Postulate 3)

$c_r^u \neq c_r^v \quad (d)$

$\therefore (x, y) . e_{r,n-r}^{x,a} = e_{r,n-r}^{y,a} = e : [c_r^x \gamma_{n-r}^a] \xi \supset_\xi [e] \xi$ (by Postulate 5*a*).

Composition.

$C_1 \ldots C_n \rightarrow E \quad (a)$

$[c_r^u \gamma_{n-r}^a e] p \quad (b)$

$\therefore [c_r^u \gamma_{n-r}^a] \xi \supset_\xi [e] \xi$ (by Postulate 3)

$[c_r^v \gamma_{n-r}^a e'] q \quad (c)$

$\therefore [c_r^v \gamma_{n-r}^a] \xi \supset_\xi [e'] \xi$ (by Postulate 3)

$[c_r^w \gamma_{n-r}^b e] t \quad (d)$

$\therefore\ [c_r^w \gamma_{n-r}^b]\xi \supset_\xi [e]\xi$ (by Postulate 3)

$c_r^u \neq c_r^v \,.\, c_r^v \neq c_r^w \,.\, c_r^w \neq c_r^u \,.\, e \neq e'$ (e)

$\therefore\ c_r^x \neq c_r^y \,.\, e_{r,\,n-r}^{x,\,a} = e_{r,\,n-r}^{y,\,b} = e : \supset_{x,\,y} \,.\, \gamma_{n-r}^a \neq \gamma_{n-r}^b$ (by Postulate 5b)

Denote the value of Γ_{n-r} which corresponds to c_r^x by ${}^x{}_r\gamma_{n-r}^e$.

Then $[c_r^x \Gamma_{n-r} e]\xi \supset_\xi [{}^x{}_r\gamma_{n-r}^e]\xi$.

Let $\Gamma_{n-r} = \mathrm{C}_s \gamma_{n-r-s}^\alpha$ (f).

Then $c_r^x \neq c_r^y \,.\, e_{r,\,s,\,n-r-s}^{x,\,a,\,\alpha} = e_{r,\,s,\,n-r-s}^{y,\,b,\,\alpha} = e : \supset_{x,\,y} c_s^a \neq c_s^b$.

Denote the value of C_s which corresponds to c_r^x by ${}^x{}_r c_s^e$.

Then ${}^x{}_r\gamma_{n-r}^e = {}^x{}_r c_s^e \gamma_{n-r-s}^\alpha$.

Whence $[c_r^x \mathrm{C}_s \gamma_{n-r-s}^\alpha e]\xi \supset_{\xi,\,x} [{}^x{}_r c_s^e \gamma_{n-r-s}^\alpha]\xi$

$\supset_{\xi,\,x} [{}^x{}_r c_s^e]\xi$.

Thus the complete final conclusion is :—

$$c_r^x \neq c_r^y \,.\, e_{r,\,s,\,n-r-s}^{x,\,a,\,\alpha} = e_{r,\,s,\,n-r-s}^{y,\,b,\,\alpha} = e : \supset_{x,\,y} c_s^a \neq c_s^b : . \ [c_r^x \mathrm{C}_s \gamma_{n-r-s}^\alpha e]\xi \supset_{\xi,\,x} [{}^x{}_r c_s^e]\xi.$$

III.—INTENSIONAL RELATIONS.

By Everett J. Nelson.

It is the purpose of this paper (1) to discuss certain fundamental intensional logical notions in comparison with extensional ones, leading to a satisfactory definition of implication, and (2) to characterize in general terms intension in contrast to extension, pointing out the significance of the contrast in regard to inference.

Since consistency or logical compatibility is one of the most fundamental of logical notions, I shall bring out the issues of this paper by considering it first.

Prof. C. I. Lewis has defined "p and q are consistent" as "it is *possible* that p and q both be true".[1] That this definition does not state the meaning of logical consistency as ordinarily used will be apparent from the consideration of the following case: Suppose that p is impossible; then p and any proposition q cannot both be true. Hence, according to the definition we are considering, p and q are inconsistent, regardless of the meaning of q. If in this example we substitute p for q, we find that p is inconsistent with itself. In other words, our objection to this definition is based on the fact that "both p and q are true" may not be possible because of the nature of p itself or of q itself separately, though not because of any relation between the meaning of p and the meaning of q. For example, since "$2 + 2 \neq 4$" is impossible, and consequently cannot possibly be true, it follows, according to the above definition, that "$2 + 2 \neq 4$" is inconsistent with any proposition whatsoever, regardless of its meaning. This I think is false. There is nothing in the meaning of "$2 + 2 \neq 4$" which is, or whose consequences are, inconsistent with the meaning of every proposition. In general terms, p may be impossible but nevertheless consistent with some proposition q. Now Prof. Lewis's notion of consistency is too narrow, for it excludes cases of propositions that are

[1] *A Survey of Symbolic Logic*, p. 293.

consistent; *e.g.*, "$2 + 2 \neq 4$" and "$2 + 2 \neq 4$"; "$2 + 2 \neq 4$" and "Napoleon defeated Wellington". And its negative "inconsistency" is too broad, for it holds certain propositions to be inconsistent which are not; *e.g.*, the illustrations in the last sentence. This situation is due (1) to the fact that material notions (*e.g.*, ordinary logical product) and intensional notions (*e.g.*, impossibility) are not kept completely separate in defining one of the latter type; and (2) to the failure to recognize the essentially relational character of consistency and inconsistency.

Mr. Bertrand Russell defines "p and q are incompatible" by "either p or q is false". Hence according to his view a false proposition is incompatible with any proposition: even with itself. To define all logical notions extensionally would seem to imply the view that the inconsistency (or logical opposition) of propositions is a relation not intrinsic to the propositions, but is, rather, founded on their truth-values; and hence that knowledge of the consistency or inconsistency of any given contingent propositions cannot arise through an examination of the propositions themselves, but presupposes a knowledge of their truth-values. Now this view, in holding that inconsistency is a truth-function, puts the cart before the horse. For, if two propositions be incompatible, then I can conclude that not both are true.[1] But from the mere data that one of them is false, I cannot conclude that they are incompatible. Such definitions of logical notions as this of Mr. Russell's are in terms of matter of fact, not of logical necessity.

Moreover, according to such a view, two propositional functions would be said to be logically opposed if no instance of the one is true when an instance of the other is true. The fact that two propositional functions never have true instances at the same time is not the reason for their being incompatible, but their being incompatible is a sufficient reason for their "never" having instances that are true at the same time.[2] The defining of intensional or apodeictic notions in terms of truth-values would seem to presuppose some metaphysical view to the effect that every *compossible* will sometime or other be actual.

In a material logic relations may be defined by truth-tables. For example, material implication may be defined as follows:

[1] Though I do not use it as a definition of consistency, this idea suggests Leibniz's notion of compossible.

[2] Similar remarks are relevant to Mr. Russell's definition of *necessary*, *possible*, and *impossible* in terms of truth-functions of propositional functions. *Introduction to Mathematical Philosophy*, p. 165.

If p be :	*and q be :*	*then p implies q is :*
true	true	true
true	false	false
false	true	true
false	false	true

In other words, p implies q in all cases except when p is true and q is false.

Now in a similar manner let us make a truth-table for " consistency " and let us use not only assertoric but also modal truth-values in order to insure that we omit no possible combination of truth-values.

If p be :	*and q be :*	*then that p is consistent with q is :*
True and necessary	True and necessary	true
True and necessary	True but not necessary	true
True and necessary	False and impossible	undetermined
True and necessary	False but not impossible	true
True but not necessary	True but not necessary	true [1]
True but not necessary	False and impossible	undetermined
True but not necessary	False but not impossible	undetermined
False and impossible	False and impossible	undetermined
False and impossible	False but not impossible	undetermined
False but not impossible	False but not impossible	undetermined

A few illustrations may assist in interpreting the above table. The propositions " $2 + 2 \neq 4$ " and " $3 + 3 \neq 6$ " are false and impossible, yet consistent. But " $2 + 2 \neq 5$ " and " $2 + 2 \neq 6$ ", though likewise false and impossible, are inconsistent. Hence, since we can find false and impossible propositions which are consistent, and other false and impossible propositions which are inconsistent, we cannot determine on the mere data that p and q are false and impossible whether they are consistent or inconsistent. A similar situation holds in every case where " undetermined " appears in the above table. The appearance of " true " means that no propositions having such and such truth-values are inconsistent. " False " does not occur because for every combination of truth-values consistent propositions can be found.

[1] That all true propositions are consistent with each other depends upon the assumption that the reality of which the propositions are true is internally consistent. Whether or not this be true is not a problem of logic. Hence, perhaps I should have written " undetermined " in this case. By " necessary " and " impossible " I mean of course " logical necessity ", and " logical impossibility ", not, *e.g.*, " physical ".

As is now apparent, our table [1] allows us to conclude to a consistency relation holding between the propositions p and q in four of the truth-value combinations, but supplies no means of deciding in the other six combinations. Consequently this table is not a definition of consistency or of inconsistency. If it were a definition of consistency—*i.e.*, if consistency were a truth-function—every "undetermined" would have to be replaced by "true" or "false"; and there would have to be at least one "false", because some propositions are inconsistent with others. Moreover, no case should be undetermined; because any two propositions are either consistent or inconsistent.

Now I submit that in ordinary discourse and in the usage of traditional logic "consistency" (compatibility) is not a truth-function; rather, it holds between the *meanings* of the propositions *in relation to one another*. No property, truth-value, or essence of a single proposition p is sufficient to determine whether it is consistent or inconsistent with just any other randomly selected proposition q. That is to say, from the mere fact that p is false or impossible it cannot be determined that it is inconsistent with q. The meanings of both propositions are required to determine the relation. Accordingly, since truth-values are not sufficient, such intensional relations are not truth-functions. Or, in other words, consistency, and therefore entailment, being defined in terms of it, are intrinsic-relation functions of propositions (or more precisely, of propositional functions).

Now, before extending this comparison to implication, it is necessary to enumerate and discuss briefly certain fundamental notions (besides consistency) in terms of which, taken as primitive, I shall define other intensional notions (*e.g.*, intensional implication or entailment). Then after considering implication I shall (1) state and discuss a few propositional functions employing our primitive and defined ideas, and (2) deduce from these propositional functions others which will make the original ideas still more explicit. Needless to say I do not pretend that the assumed ideas are exhaustive of intension.

1. *Propositional functions : p, q, r.* I take the term "propositional function" to mean any form such that when the values of the variables in it are determined the result is a proposition; *e.g.*, in the symbolism of the *Principia Mathematica*, x, and $p \supset q$ are propositional functions, though of different types.

[1] In interpreting this table, it must not be assumed that "'p is consistent with q' = '$-p$ is consistent with $-q$'" or that "'p is consistent with q' = '$-p$ is inconsistent with $-q$'" can be asserted on logical grounds.

By p I do not mean "p is true" but simply the propositional function p itself. Similarly, if A be a proposition, I do not mean by it "A is true", but simply the proposition A itself. I take "propositional function" rather than "proposition" as fundamental because intrinsic logical relations hold directly between the structures or formal significance of propositions (*i.e.* between propositional functions of which propositions are instances) and only derivatively or indirectly between propositions as such, in virtue of their having these structures and their fulfilling certain conditions as to the identity of terms.

2. *Conjunction:* pq. I do not take pq to mean "p is true and q is true", but simply "p and q", which is a unit or whole, not simply an aggregate, and expresses the *joint* force of p and q. I say that pq is not a simple aggregate composed of p and q because, for example, in asserting that pq entails[1] r, I am not asserting something simply about p and about q, but about them taken together, *i.e.*, their *joint* force. pq does not entail r unless both p and q *function together* in entailing r. It is this functioning together or joint force that gives to conjunction a unity which a mere aggregate or collection does not have. And this unity of conjunction is in a sense relational; *e.g.*, the propositions, "All men are mortal" and "Socrates is a man" form a conjunction in relation to "Socrates is mortal", for "Socrates is mortal" expresses their joint force; but they do not form such a conjunction in relation to "Socrates is a man". However, if pq alone be asserted, then the mere aggregate of p and q is asserted; *i.e.*, p is asserted and q is asserted. In such a case the unity of the conjunction is lost, and the mere assertion of each component remains.

3. *Consistency:* poq. (See above discussion.)

4. *Contradiction:* $-p$. $-p$ symbolizes the propositional function which is the proper contradictory of the propositional function symbolized by p. $-p$ does not mean "p is false".

5. *Intensional equivalence:* $p = q$. This notion, $p = q$, will be defined as reciprocal entailment.

Now in terms of these notions taken as primitive I shall define inconsistency, entailment (intensional implication), intensional logical sum, and intensional equivalence.

(*a*) *Inconsistency:* $p/q \,.=.\, -(poq)$.

(*b*) *Entailment:* $p\mathrm{E}q \,.=.\, p/-q$. The propositional function

[1] Since "entails" has not yet been defined, "implies" may be read instead of it; for, although these notions are not the same, our point here concerns only the *unity* of conjunction.

"p entails q" means that p is inconsistent with the propositional function that is the proper contradictory of q (*i.e.*, with $-q$). Entailment, not being defined in terms of truth-values, is a necessary connexion between meanings. I believe that this analysis of entailment comes much closer to expressing what "implies" means in ordinary discourse than does either material or strict implication.[1] The difference between entailment, as here defined, and material implication ($p \supset q \,.=.\, \sim p \vee q$) is so obvious as to call for no detailed comparison; but in relation to what Prof. Lewis has called "strict implication" this is not the case. That one proposition strictly implies another means, according to him, that it is impossible that both the former and the contradictory of the latter be true; or in symbolism, $p \dashv q \,.=.\, \sim (p - q)$, where $\dashv$ means "strictly implies" and $\sim$ means that the proposition following it is impossible. This notion of Strict Implication seems to hold when and only when entailment holds, *except* in certain cases in which propositions are apodeictic (*i.e.*, necessary or impossible). By way of illustration let us take at random (1) any proposition r, and (2) any impossible proposition s. Since s is impossible, the proposition "both r and s are true" is impossible. Now this impossible conjunction—that is $\sim (rs)$—fulfils the necessary and sufficient conditions for a case of strict implication, because it supplies a case of the right side of the symbolic definition of strict implication above. Now this situation gives rise to two cases. (1) If we substitute s for p and $-r$ for q in this symbolic definition of strict implication, our result is: $s \dashv -r \,.=.\, \sim (sr)$. Since sr is equivalent to rs, which according to our example is impossible, we may assert the left side of the equation; that is, we may assert that any impossible proposition s strictly implies any proposition $-r$. (2) Now for the second case let us make our substitutions the reverse of those in the first; namely, r for p and $-s$ for q. We get $r \dashv -s \,.=.\, \sim (rs)$. That is, any proposition r strictly implies any necessary proposition $-s$. ($-s$ is necessary because it is the contradictory of the impossible proposition s.) These

[1] It is interesting to note that Mr. Russell, in explaining "Descriptions" in his *Introduction to Mathematical Philosophy*, p. 177, uses a form of implication not material when he says of the three propositions, "at least one person wrote *Waverley*", "at most one person wrote *Waverley*", "whoever wrote *Waverley* was Scotch", that "the three *together* (but no two of them) imply that the author of *Waverley* was Scotch". Since according to material implication true propositions imply each other, either two of the first three, or any of them alone, materially implies the conclusion! In this case the notion of implication Mr. Russell has in mind appears to be similar to entailment.

paradoxes, corresponding to those of material implication,[1] convince me that Strict Implication is not what is ordinarily meant by *implication*. It is too broad, for it includes cases which are not implications in any ordinary sense; which fact means that its "definition" is not convertible. In other words, though we may say that if p implies q then $p - q$ is impossible, we must not say that if $p - q$ is impossible, p implies q. Our definition of entailment excludes these illegitimate cases but covers all others. The "implication" of ordinary discourse is, like consistency, essentially relational: it depends upon the meaning of *both* propositions. The impossibility feature of Strict Implication is sound, but the use of conjunction in the definition of it is questionable. For example, the assertion of necessary connexions in the following propositions is due to this use of conjunction: "'$2 + 2 = 5$' strictly implies 'Wellington defeated Napoleon'" and "'$2 + 2 = 5$' strictly implies '$2 + 2 \neq 5$'". In the former case the necessary connexion is asserted between intrinsically independent propositions; in the latter an impossible proposition is said to necessitate its contradictory. Obviously the meaning or structure of "$2 + 2 = 5$" does not contain or yield by analysis the meaning or structure of either of the other two propositions.

(*c*) *Intensional logical sum:* $p \mathbf{V} q \,.=.\, -p/-q$. "$p \mathbf{V} q$" may be read "either p or q", but it holds only if there is a necessary connexion between p and q, regardless of whether or not either or both are necessary. It must not be confused with "$p \mathbf{v} q$" which is merely factual.

(*d*) *Intensional equivalence:* $p = q \,.=.\, p \mathrm{E} q \,.\, q \mathrm{E} p$. It seems to follow from the analytic nature of intensional logical propositions that intensional equivalence is what is usually called the relation of identity.[2] "$p = q$" would then mean that p and q

[1] The use of the term implication in such paradoxical cases is sometimes defended by a language argument to the effect that cases of such paradoxes are frequently used in ordinary discourse; *e.g.*, "If he succeeds, I'll eat my hat", "If to-day is Tuesday, Socrates is a fish", etc. Such propositions are asserted because of the knowledge that, or of the high probability that, the antecedent is false. But here we must make a distinction. Logicians have assumed without question that in ordinary language "implies" may be interchanged with "if . . . then". It is true that an "implies" may always be replaced by an "if . . . then", but an "if . . . then" may not always be replaced by an "implies". Would he who asserted, "If he succeeds, I'll eat my hat", also assert that "He succeeds" implies "I'll eat my hat"?

[2] Strictly speaking it seems that identity is not a relation but is the absence of difference. This however is irrelevant to our discussion.

are one and the same proposition, though designated by different symbols. If this be so, then entailment is an identity between a structural part (though not necessarily less than the whole) of the antecedent and the entire consequent. That is to say, an entailment represents a logical analysis. Similarly, "poq" would mean that p, in whole or in part, is not identical with the whole of $-q$.

In terms of the foregoing ideas we are now able to state propositional functions making these ideas more explicit. Of such propositional functions perhaps the most distinctive in intension is $p\mathrm{E}q\,.\,\mathrm{E}\,.\,poq$. If p entails q, then p is consistent with q. This assertion, together with $p\mathrm{E}p$, gives rise to pop. A propositional function (and hence a proposition) is consistent with itself. The significance of this is evident when we recall that according to Mr. Russell a false proposition is incompatible with itself, and according to Prof. Lewis an impossible proposition is inconsistent with itself. Though it may be that a part of a proposition is inconsistent with another part, the proposition as a whole is not inconsistent with itself as a whole. For example, in regard to the proposition "All men are mortal and some men are not mortal", the two component propositions are inconsistent with each other, but the whole compound proposition is not inconsistent with itself as a whole. Among the many other propositional functions in such a system would be $-(p\mathrm{E}-p)$, which too is especially interesting in reference to systems in which a false or an impossible proposition implies its contradictory.

Now let us consider certain characteristically extensional propositions which have no corresponding forms in intension. For example, there is asserted no propositional function corresponding to "$pq \supset p$" or to "$p \supset p \vee q$", which are characteristically extensional assertions.[1] Naturally, in view of the fact that a conjunction must function as a unity, it cannot be asserted that the conjunction of p and q *entails* p, for q may be totally irrelevant to and independent of p, in which case p *and* q do not entail p, but it is only p that entails p. I can see no reason for saying that p and q entail p, when p alone does and q is irrelevant, and hence does not function as a premise in the entailing. $pq\mathrm{E}p$ looks innocent enough, but in order to make explicit its real import, let

[1] The assertion of a propositional function means the assertion that it is a propositional form or structure such that instances of it (*i.e.*, propositions) are certifiable on logical grounds. In other words, an asserted propositional function is one asserted to be a "validating form", to employ an expression of Prof. A. N. Whitehead's.

us substitute p for r in the Principle of the Antilogism ($pq\mathrm{E}r . = . p - r\mathrm{E} - q . = . q - r\mathrm{E} - p$). We get:

$$pq\mathrm{E}p . = . p - p\mathrm{E} - q . = . q - p\mathrm{E} - p,$$

in which $pq\mathrm{E}p$ is equated to $p - p\mathrm{E} - q$. Therefore, the assertion of $pq\mathrm{E}p$ gives rise to an assertion in which the contradictory of what originally was irrelevant has become one of the complete terms of the entailment relation, in which entailment relation the antecedent and consequent are logically independent of one another. Though "p and q *entail* p" cannot be asserted on logical grounds, I do not deny that from "p is true and q is true" we can pass to "p is true". All I deny is that such a passage is in virtue of an entailment relation holding between "p is true and q is true" and "p is true".

Furthermore, "p entails p or q" cannot be asserted on logical grounds, because from an analysis of p we cannot derive the propositional function "p or q" where q is a variable standing for just any other propositional function whatsoever. Of course if p has truth, then "p or q" has truth, but here in intension we are dealing neither with truth-values nor with material implication, but with propositional functions in their essence and with entailment. The disjoining of q to the consequent of $p \supset p$ is a synthetic feature of material systems, and is justifiable in such systems because disjoining adds no new unconditionally assertible content.

Needless to say, it is to "$pq \supset p$" and "$p \supset p \vee q$" that the so-called Paradoxes of Implication are due.[1] Since in intension corresponding propositional functions are not asserted, corresponding paradoxes do not arise.

In view of the fact that $pq\mathrm{E}p$ is not assertible, we must restate the Principle of the Syllogism ($p\mathrm{E}q . q\mathrm{E}r . \mathrm{E} . p\mathrm{E}r$) this way: $p * q * r : \mathrm{E} : p\mathrm{E}q . q\mathrm{E}r . \mathrm{E} . p\mathrm{E}r$, in which

$$p * q * r . = . - (p = q) . - (p = r) . - (q = r).$$

Otherwise, if we substitute, for example, q for r, we get

$$p\mathrm{E}q . q\mathrm{E}q . \mathrm{E} . p\mathrm{E}q,$$

which is of the form $pq\mathrm{E}p$. The logical import of the Principle of the Syllogism lies in its stating the transitivity of the implicative

[1] The so-called paradoxical propositions both of material and of strict implication are in terms of the respective systems not paradoxes at all. It is only when we are told that the symbols $\supset$ and $\prec\!\succ$ represent what is commonly understood by the word "implication", that these propositions appear paradoxical.

(in our case, entailing) relation. Essential to its form (structure) as a principle of transitivity is the diversity of certain elements (here, p, q, r), and it is in this respect that our additional antecedent keeps the form of the principle from being degenerated by substitution.

Now, in order to present the notions of intension in a brief but comprehensive fashion, let us take the following propositional functions, expressed in terms of the foregoing ideas, as postulates, which will in turn serve as systematic definitions of the assumed ideas—definitions in the sense of limiting the range of the possible interpretational values of each variable.

(1) $p\mathrm{E}p$ (4) $p\mathrm{E}q \,.\, \mathrm{E} \,.\, poq$
(2) $p/q \,.\, \mathrm{E} \,.\, q/p$ (5) $p \neq q \neq r : \mathrm{E} : p\mathrm{E}q \,.\, q\mathrm{E}r \,.\, \mathrm{E} \,.\, p\mathrm{E}r$
(3) $p\mathrm{E} - - p$ (6) $pq \,.=.\, qp$
(7) $pq\mathrm{E}r \,.\, \mathrm{E} \,.\, p - r\mathrm{E} - q$

By using a principle of inference and the method of proof employed in the *Principia Mathematica*, we can derive from the above postulates theorems making still more explicit our fundamental intensional notions. Among the most significant of these are:

(*a*) $p/- p$ (*f*) $poq \,.\, \mathrm{E} \,.\, -(p\mathrm{E} - q)$
(*b*) $p \vee - p$ (*g*) $-(p\mathrm{E} - p)$
(*c*) pop (*h*) $p/q \,.\, \mathrm{E} \,.\, po - q$
(*d*) $p\mathrm{E}q \,.=.\, - p \vee q$ (*i*) $p\mathrm{E}q \,.\, \mathrm{E} \,.\, - (p\mathrm{E} - q)$
(*e*) $p\mathrm{E}q \,.=.\, -q\mathrm{E}-p$ (*j*) $pq\mathrm{E}r \,.=.\, p - r\mathrm{E} - q \,.=.\, q - r\mathrm{E} - p$
(*k*) $pqor \,.=.\, proq \,.=.\, qrop$

A brief consideration of the principle of inference is here necessary. The principle of inference in the *Principia Mathematica* is redundant, for material implication itself, as defined, legislates that the conclusion implied by true premises is true.[1] That is, I can assert that q is true if I know that p and "p implies q" are true, without appeal to Postulate *1 . 1, because, since p is true, the definition of implication precludes that q, which is an implicate of p, can possibly be not true. The definition of implication amounts to this: p implies q in all combinations of their truth-values except one, *viz.*, when p is true and q is false. Stated negatively the principle of inference is this: Nothing implied by a true proposition is not true. And since every case of a significant proposition's being not true is a case of its being false, the import of this principle may be stated as follows: There is no

[1] "Anything implied by a true elementary proposition is true". Postulate *1 . 1, p. 94.

case of a false proposition that is implied by a true proposition. This statement follows from the definition of implication.

Now the situation is different in our case, because entailment is not defined as a truth function. Hence we formulate the following principle to justify our assertion of a proposition entailed by a true one: Any proposition (or propositional function) entailed by an asserted proposition (or propositional function) is itself categorically asserted.

In concluding this paper I wish to state the contrast between intension and extension, and to characterize intension, in more general terms than our detailed considerations have permitted. Extensional propositional logics formulate relations between propositions (or propositional functions) in virtue of two or more exclusive and exhaustive properties or truth-values of propositions. At least so far as contingent propositions are concerned these truth-values are extrinsic properties of the propositions; *i.e.*, the propositions could be true or false and still have the same meaning (intrinsic content, essence, structure).[1] Or in other words, since the essence of the proposition is independent of its truth-value, change of truth-value is not determinant of change in meaning. Hence, relations holding in virtue of such extrinsic properties are extrinsic—are not constitutive of the meaning of the propositions involved. However, if p and q be intensionally related by R, then they are such that if R did not hold, p or q would have to have a different essence or meaning. Examples readily bring out this contrast between intension and extension. (1) "Napoleon defeated Wellington at Waterloo" is externally related to and materially implies "The Earth is nearer than Mars to the Sun". Had Napoleon won, this implication would not hold, but the meaning of each proposition would nevertheless be what it now is. (2) But the implication between "There are ten men in this room" and "There are nine men in this room" holds regardless of the truth-value of either proposition. That is, it is an intensional relation, a relation holding between the meanings of the propositions.

Just as intensional relations are intrinsic, so propositions stating intensional relations are *analytic;* that is, they are such that a logical analysis of the constituent propositions is sufficient to determine the intensional relation holding between them. In this

[1] I use the terms "meaning" and "structure" interchangeably, since I am dealing with logical relations, though perhaps I should point out that they are not equivalent in regard to propositions. *E.g.*, "x is west of y" and "Chicago is west of New York" have the same structure, though the terms of the latter have meaning in addition to the structure.

sense certain cases of material implication are synthetic; that is, from a mere analysis of the meaning of the propositions it is impossible to determine that the one implies the other; *e.g.*, "'Berlin is in France' implies 'New York is in America'" is such a synthetic proposition.

The importance of this difference between a logic in which relations are based on facts extrinsic to the essence of the propositions and one in which they are based on the essence itself becomes apparent if we consider it in relation to inference. In order to bring out the issue, I shall present a quotation from Mr. Russell which makes clear the requirements for the practical feasibility of inference; I shall then show that material implication fails to meet these requirements. "There is, if I am not mistaken, a certain confusion in the minds of some authors as to the relations between propositions, in virtue of which an inference is valid. In order that it may be *valid* to infer q from p, it is only necessary that p should be true and that the proposition 'not-p or q' should be true. Whenever this is the case, it is clear that q must be true. But inference will only in fact take place when the proposition 'not-p or q' is *known* otherwise than through knowledge of not-p or knowledge of q. Whenever p is false, 'not-p or q' is true, but is useless for inference, which requires that p should be true. Whenever q is already known to be true, 'not-p or q' is of course also known to be true, but is again useless for inference, since q is already known, and therefore does not need to be inferred. In fact, inference only arises when 'not-p or q' can be known without our knowing already which of the two alternatives it is that makes the disjunction true. Now, the circumstances under which this occurs are those in which certain relations of form exist between p and q. For example, we know that if r implies the negation of s, then s implies the negation of r. Between 'r implies not-s' and 's implies not-r' there is a formal relation which enables us to *know* that the first implies the second, without having first to know that the first is false or to know that the second is true. It is under such circumstances that the relation of implication is practically useful for drawing inferences.

"But this formal relation is only required in order that we may be able to *know* that either the premiss is false or the conclusion is true. It is the truth of 'not-p or q' that is required for the *validity* of the inference; what is required further is only required for the practical feasibility of the inference." [1]

[1] *Introduction to Mathematical Philosophy*, pp. 152 f.

Now it is important to notice that even though material logic may furnish us with such a form as $r \supset - s \,.\supset.\, s \supset - r$, we still have insufficient apparatus for the actual drawing of a categorical inference in any given concrete case. In order actually to infer q from p I must know that p is true and that p implies q, and the grounds for my knowledge that p implies q must not include knowledge that q is true. Material logic, since its relations are founded upon truth-values, cannot furnish any such knowledge of relations between p and q which does not presuppose a prior knowledge which would render the inference unnecessary, where p and q may be propositions of any form—not limited to such as $r \supset - s$ and $s \supset - r$. But an intensional logic does provide sufficient criteria for such relations, which criteria are based exclusively on the intrinsic content (meaning) of the propositions involved, apart from knowledge of truth-values, and hence satisfies Mr. Russell's statement that " inference will only in fact take place when the proposition ' not-p or q ' is *known otherwise*[1] than through knowledge of not-p or knowledge of q ". In other words, an intensional, but not a material logic, provides the formal relations needed for inferring q from p, where p and q are any propositions whatsoever, simple (*e.g.*, p) as well as complex (*e.g.*, pEq), without appeal to extra-logical facts. Specifically, we know in intension that p entails q if and only if p is inconsistent with $- q$, and since this notion of inconsistency is strictly logical, whether or not it holds can be determined on and only on logical grounds.

An example from the field of induction will make this clear. Suppose we have a certain fact to be explained. Hypothesis H_1 is offered in explanation thereof. Now since an hypothesis is verified by testing its implications, we must draw consequences from H_1; *i.e.*, we must see what it implies. Now suppose we have only a material logic. Since the implications of a proposition depend upon its truth-values, and since we do not know whether H_1 be true or false, no implications can be drawn except on a further hypothesis of its truth-value. Suppose H_1 be false; then it implies every proposition, and since some propositions are false, it has false consequences, and hence is disproved. But this is not convincing since the argument has been circular. The other alternative is to suppose that the hypothesis is true. Then it implies all true but no false propositions, and hence is " verified ". But those persons opposing H_1 as an explanation not only point out that this latter argument likewise has been circular

[1] Italics of " otherwise " mine.

but also set up the rival hypothesis H_2, and show that by assuming its truth it is verified in the same manner as H_1. Hence there arises an impasse, for there can be no decision between the rival hypotheses, each of which is inconsistent with the other. Now, the validity and fertility of the method of hypothesis lies in the fact that the consequences of an hypothesis may be drawn independently of its truth-value, and hence, that an hypothesis, though assumed to be true, may nevertheless have false consequences. The drawing of consequences in such a case presupposes a logic such that an examination of the intrinsic content of a proposition apart from considerations of truth and falsity is sufficient to the deduction of its consequences. The foregoing illustration, disclosing the insufficiency of material implication to the drawing of consequences from simple propositions, makes clear that the requirements for the feasibility of inference—namely, that the consequences of p must be able to be deduced from p independently of its truth-value and of the truth-value of its consequences—are not met by an extensional logic. As Prof. Lewis has said, "*Inference* depends upon meaning, logical import, *intension*".[1]

[1] *Op. cit.*, p. 328.

IV.—DISCUSSIONS.

OTHERNESS AND DISSIMILARITY.

THE matter that I am going to discuss arises in connexion with a point made by Prof. G. E. Moore in the course of his paper on "The Conception of Intrinsic Value".[1] He there calls attention to a distinction that must be drawn whenever we are discussing the notion of *exact likeness* as applied to particular things. Everybody agrees that there is a sense in which we can say of two things that they are exactly alike intrinsically, and can, in so doing, express a proposition that is at least logically possible. If, for instance, A and B are two separate patches of colour, it is clearly logically possible that they should resemble each other in such a way that there would be no point of intrinsic dissimilarity between them. Now we are, at first sight, inclined to say that this is tantamount to the possibility that A and B should have all their intrinsic properties in common; but Prof. Moore is careful to point out that it is in fact quite impossible that one thing should possess every intrinsic property possessed by another. For suppose that α is a certain specified part of A, and that β is the corresponding part of B. Then A possesses the intrinsic property "having α as a part", which B does not possess, while B possesses the intrinsic property "having β as a part", which A does not possess. And even if A and B were not entirely separate, even if they overlapped, they could not have all their parts in common, so that one of them would necessarily possess some property of the sort here in question which was not possessed by the other; and even if they were simple, and had no parts, B would still possess the property "being other than A", which A would not possess. We should say, of course, that such a divergence of properties, while showing that A and B differed intrinsically, would have no tendency to show that they were not exactly similar. And it is clear enough what the properties are that two things may fail to have in common and yet be intrinsically exactly alike: they are all those intrinsic properties which themselves involve as constituents particular things, such as α and β.

I believe scarcely anybody would think of calling in question the point here made; it simply involves rendering quite precise the

[1] *Philosophical Studies*, p. 262.

common distinction between qualitative difference and difference that is merely numerical. Still, a good many people seem to hold that when we take account of extrinsic properties as well as intrinsic ones, we can see that no two things can possibly be exactly alike; there must, they seem to say, be some point of dissimilarity, either extrinsic or intrinsic. And I suspect this view often arises in consequence of a failure to carry over to the question of extrinsic resemblance this distinction which everyone would admit with regard to intrinsic resemblance, and in consequence of a failure to observe that from the mere fact that there are many intrinsic and extrinsic properties possessed by one thing and not by another, it does not in the least follow that the two things are dissimilar in any respect whatever. So I think it worth while extending the point made by Prof. Moore to the case of extrinsic resemblance. But before I go on to this matter, I am going to point out and discuss briefly several different sorts of properties that a thing may possess, with a view to discriminating as sharply as possible between those properties which are intrinsic to the things that possess them and those which are extrinsic.

Let us consider again the patch of colour A. We can say of A that it is round, that it is coloured, that it is extended, etc., where each of these properties is what we may call, for want of a better term, a *simple property*. These are intrinsic properties; their possession is not logically dependent upon any existent other than and not a part of A. Then there are all those intrinsic properties of A like "having α as a part" and "being identical with A", which we may call *relational properties*, because they arise from a relationship in which A stands. Simple properties are always intrinsic, but many relational properties, such, for instance, as the one that A has of being near B, or the one that it has of resembling B, are extrinsic. Now, let us take four circular patches of colour, X, Y, X', Y', which we may suppose to be such that X overlaps Y, and such that X' overlaps Y', but such that no other overlapping occurs. Then the property "overlapping Y" belongs to X but not to X', whereas the property "overlapping Y'" belongs to X' but not to X; so that, in this respect, X and X' do not have a relational property in common. Nevertheless, in virtue of the fact that X overlaps Y, it has the property of overlapping something, and in virtue of the fact that X' overlaps Y', it also has this property; so that X and X' do have in common "overlapping something or other". We may call this a *secondary property*. It is non-relational, since it does not involve a particular thing as a constituent; but the possession of such a property does, of course, presuppose the possession of at least one relational property. And it is to be noted that although "overlapping something or other" is extrinsic, "having something as a part" is intrinsic, so that there occur both intrinsic and extrinsic secondary properties. Finally, there are certain intrinsic properties that a thing may have which might

possibly be confused with extrinsic secondary properties. Consider the patch of colour A, and the property it has of being perceived by T. Since A is perceived by T, it has the secondary property of being perceived by some one, and therefore has the property "being susceptible of being perceived". When we say that if there were perceivers who stood in certain relations to A, they would perceive it, we are assigning the property in question; and although we are here supposing A to be in fact perceived by some one, it is of course clear that A might be susceptible of being perceived without actually being perceived by anybody at all. We may call this a *conditional property*. It is intrinsic, since it is possessed solely in virtue of A's intrinsic nature.

This classification is, of course, incomplete, but I think it will be sufficient for my limited purposes. It does not involve negative properties, such as "not being round", "not being near B", "having nothing as a part"; and we may conveniently neglect such properties as these in what follows, because we shall really be taking account of them in saying of things that they lack corresponding positive properties, and because, by adopting this procedure, we shall make the definition of extrinsic and intrinsic properties simpler than it would otherwise be. This definition, as confined to positive properties, is as follows: A property of a thing, A, is extrinsic if, and only if, from the fact that A possesses that property, it follows that there is at least one thing other than and not a part of A; otherwise, the property is intrinsic. Thus, "having α as a part" is intrinsic to A, since it does not follow from the mere fact that A has α as a part that there exists any particular thing separate from A. On the other hand, the property that A has of being near B is extrinsic, since from the fact that A has this property, it does follow that there is something outside A; and the same may be said with regard to the secondary property "being near something or other". Consider, however, the property that A has of resembling something. It is true that "resembling B" is extrinsic to A; but since A resembles itself, we are not able to infer from the mere fact that A resembles something or other that there is anything distinct from and not a part of A; so that this secondary property must be held to be intrinsic.

We may now return to the question of exact likeness among things. Let us take again the four circular patches of colour X, Y, X', Y', which we are supposing to be such that X overlaps Y, and X' overlaps Y', but such that no other overlapping occurs; and let us suppose, further, that X is exactly similar to X' intrinsically, and that Y is exactly similar to Y'. Since Y and Y' have a common intrinsic nature, ϕ, both X and X' have the secondary property "overlapping something of the kind ϕ", despite the fact that the thing satisfying this condition in the one case is numerically distinct from the thing satisfying it in the other. And if we confine attention to the four things in question, it is plainly possible that X

and X' should be exactly alike extrinsically as well as intrinsically; all that is necessary is, that all relations between X and X' should hold both ways, that X should have to Y every relation X' has to Y', that X' should have to Y every relation X has to Y', and that all relations between Y and Y' should hold both ways. Moreover, this same situation might obtain if we took account of still other things. For suppose that Z is another thing, to which X has the relation R. Then X' might have this same relation to Z; but if it did not, there might then be yet another thing, Z', exactly like Z intrinsically, to which X' had the relation R. And although the fact that X' had R to Z' rather than to Z would constitute a point of difference between X and X', it would not constitute a point of dissimilarity.

In order to get an actual case, let us suppose some one to raise the question whether we are able to know that there cannot be another thing exactly like the earth, both intrinsically and extrinsically. We plainly cannot know that there is not another thing exactly like the earth intrinsically; but we do know, for instance, that nothing else has the relation to the moon which the earth has, and so we know that a duplicate of the earth, if one exists, lacks certain extrinsic properties possessed by the earth. But we have no way of knowing that there is not a duplicate of the earth which possesses exactly similar extrinsic properties. If the moon also has a duplicate, then the relation in which the earth stands to the moon may also hold between the duplicate of the earth and that of the moon, and the relation in which the earth stands to the duplicate of the moon may also hold between the duplicate of the earth and the moon. Such symmetry would be like that obtained when a number of things are reflected in a mirror; and it is clear that still more complex types of symmetry are equally possible. Two or more things are exactly similar, both intrinsically and extrinsically, if and only if they have all their non-relational properties in common.

So far as I am aware, Dr. J. E. McTaggart is the only writer who has argued explicitly that two things cannot have all their non-relational properties in common, and I think I had better try to deal here with his argument. The first volume of *The Nature of Existence* contains two consecutive chapters which are devoted to an attempt to establish the point in question. One of these chapters is entitled "Dissimilarity of Substances", and in this chapter McTaggart holds merely that two things cannot have in common absolutely all their properties. This is, as we have seen, quite certainly true; if A and A' are distinct things, then "being other than A" and "being other than A'" are properties that are not possessed in common. McTaggart points out this simple proof of his thesis, but he does not rely upon it alone; he seems to wish to show also that A and A' will involve some divergence of properties other than that contained in the mere fact that each is distinct from

the other and identical with itself. And if, as he maintains, all substances are complex, and have parts, this will surely be true; for one of the two things will then inevitably stand in relations to at least some of its parts in which the other will not stand to those parts.

It may not be clear to the reader why McTaggart calls this first chapter "Dissimilarity of Substances", since it is really concerned with Difference of substances rather than with Dissimilarity, properly so called. He is, however, using the term Dissimilarity in an unusual sense. He is using it in such a sense that no two things can be exactly similar unless they have in common all their relational properties as well as all their non-relational ones. And, of course, he has shown that nothing can be exactly similar to anything else in the sense in question. But in his next chapter, on "Sufficient Description", he goes on to maintain, in effect, that no two things can be exactly similar in the sense of having all their non-relational properties in common. This second chapter begins with a definition of an Exclusive Description of a thing or substance: ϕ will be an exclusive description of A if and only if ϕ describes A and nothing else. Thus, "being a satellite of the earth" is an exclusive description of the moon. And it is easy to see, in view of what has already been shown, than any given thing, A, must have an exclusive description; for if $p, p', \ldots$ are all the properties that A has, and $q, q', \ldots$ all that it does not have, then "having $p, p', \ldots$, and lacking $q, q', \ldots$" will not describe anything other than A. A Sufficient Description is then defined as an exclusive description which does not involve relational properties. And it is maintained that since each thing must have an exclusive description, then, in virtue of certain further considerations, each thing must have a sufficient description. That is to say, it is held that we must be able to drop all relational properties from the description of A just indicated without rendering it non-exclusive.

In developing his argument, McTaggart points out that since we know, to begin with, merely that each thing is differentiated from each other thing by some property or other, then, in order to distinguish an assigned substance, A, from another one, A', it might seem necessary to bring in a fact to the effect that A stood in a certain relation, R, to a particular thing, B, and thus to bring in a relational property. In that case, however, we might consider a description, ϕ, which applied to B, and which was made up wholly of non-relational properties: A would possess the secondary property "having R to a thing of the kind ϕ"; and if it so happened that A' did not possess this property, we should have succeeded in distinguishing A from A' without the use of relational properties. It might happen, however, that A' stood in the relation R to a thing, B', which satisfied the description ϕ, and thus that A' also possessed the property "having R to a thing of the kind ϕ". But we might, of course, try again: B might differ from B' in virtue of the fact that it had the relation S to C, so that A would differ

from A' by having the relation R to a thing of the kind ϕ which had the relation S to C; and if it were but true, further, that A differed from A' in virtue of having the relation R to a thing of the kind ϕ which had the relation S to a thing of the kind ψ, where ψ was a non-relational description applicable to C, we should have succeeded in distinguishing between A and A' without the aid of relational properties. But, of course, B' might have the relation S to C', where C' was a thing of the kind ψ. And it looks as if this regression might have no termination, and thus as if a sufficient description of A might not be found. McTaggart holds, however, that such a regression would be vicious; he says:

"By the results of the last chapter, A must be dissimilar to all other substances. The possibility of this depends upon the existence of B, and the existence of B depends on its dissimilarity to all other substances. And this depends on the existence of C, and this on its dissimilarity to all other substances, and so on. If this series is infinite, it is vicious. For, starting from the existence of A, each earlier term requires all the later terms, and therefore requires that the series should be completed, which it cannot be. If, therefore, the series is infinite, A cannot be dissimilar to all other substances—cannot, in other words, have an exclusive description—and so cannot exist."

Now, I do not find it easy to be clear concerning what exactly the point is that McTaggart wishes to make. Of course, the term "dissimilarity", as it occurs in this passage, is to be understood in the peculiar sense indicated above, in which two things are said to be dissimilar if they do not have in common all their properties, relational and non-relational. Indeed, in showing that any two things must be dissimilar in this sense, McTaggart has really shown that they cannot have all their relational properties in common—in the argument in question, he always appeals to relational properties—so that we might replace the words "A must be dissimilar to all other substances" by the words "A and another substance must be differentiated by at least one relational property". But what does he mean by saying that each earlier term of his series requires all the later terms, and that the existence of A depends on its dissimilarity to all other substances, and thus on the existence of B? If B vanished, A' would continue to possess the property "having R to B'", which would differentiate it from A; so that the existence of A would not depend on that of B. Still, A' would possess the property "having R to a thing of the kind ϕ", which A would not possess, so that A' would be distinguished from A by a non-relational property; and this seems to be all that is really required. But, now, McTaggart must be holding that no earlier term of his series recurs at a later point—that, for instance, C is not identical with A. If this did happen, the process would become cyclic, and no sufficient description of A would be found. And although I do not see why such a cycle might not arise, I am

quite willing to grant that none will, because I do not see, even then, how a vicious regression follows.

There are three sequences of properties in question: "having R to B", "having R to B, which has S to C", etc., are properties belonging to A but not to A', whereas "having R to B'", "having R to B', which has S to C'", etc., are properties belonging to A' but not to A, while "having R to a thing of the kind ϕ", "having R to a thing of the kind ϕ, which has S to a thing of the kind ψ", etc., belong both to A and to A'. And we are told that A can exist only if it has R to B, and is thus distinguished from A', but that B can exist only if it has S to C, and is thus distinguished from B', etc.; and that since A requires B, and B requires C, A requires C. We are told, moreover, that this sequence will be vicious unless some term is reached which is differentiated from everything else by its non-relational properties, and thus does not require anything else in order to exist. This, so far as I can make out, is McTaggart's argument, and I cannot see that it is valid. He tells us that A requires all the later terms in order to exist, which means, of course, that A requires *each* of the later terms. But even if the sequence A, B, C, . . . is infinite, each of the later terms is a finite number of steps from A, so that each relational property that A must possess involves only a finite number of things; the situation does not seem essentially different in this respect from what it would be if the sequence were finite. We can, perhaps, see more clearly the import of McTaggart's argument if we take an analogous case, which would necessarily involve a vicious regression if his argument were right. Suppose we have a substance X, which has as a part X', which, in turn, has as a part X'', etc., so that we have a sequence X, X', X'', . . . , made up of X together with its parts and parts of parts. Then, in any sense whatever in which McTaggart is using the term "requires," X requires each of the later terms in order to exist; and yet such an infinite sequence seems plainly unobjectionable.

We may conclude, then, that cases of symmetry in which there occur distinct things exactly alike both intrinsically and extrinsically are logically possible. And there is one final point that may be dealt with briefly. It is sometimes held that if several distinct things were exactly alike in every respect, they could not possibly be discriminated by anybody, and could not possibly be known to be more than one thing. This view raises, in particular, the following question: If you should have within your field of presentation several distinct things which were intrinsically exactly alike, and which were exactly alike extrinsically in so far as their relatedness to other things in your presentational field was concerned, could you tell that there were several things rather than one? It seems quite clear that you could. Let us take a circle that is uniformly coloured, and let us draw two perpendicular diameters, so as to divide the circle into four quadrants, a, b, c, d. These quadrants will be exactly alike intrinsically, and if we confine attention to the circle alone,

they will also have their extrinsic non-relational properties in common. Thus, *a* is contiguous to *b* and not to *c*, whereas *d* is contiguous to *c* and not to *b*; but since *b* is exactly like *c* intrinsically, any secondary property that *a* has in virtue of its contiguity to *b* will be possessed by *d* in virtue of its contiguity to *c*. Clearly, the same will hold with regard to any other extrinsic properties; and although it is true that if you were observing a circular patch of the sort here in question, your field of presentation would involve more than the circular patch, nevertheless, the other parts of your presentational field might, under certain circumstances, be symmetrically related to the circle in such a way that *a*, *b*, *c*, *d* would still have in common all their non-relational properties. In that case, you could not distinguish the several quadrants by observing points of dissimilarity among them; but you could, of course, discriminate these quadrants, in the sense that you could tell that there were four. You could see that the quadrants just made up the circle, which you would also be observing, and you could see that the pattern required four exactly similar parts.

C. H. LANGFORD.

AN ENQUIRY CONCERNING THE LOGIC USED IN PSYCHOANALYSIS.

VIEWED as a system of hypotheses, the Freudian theoretical edifice has a special attraction to philosophers aside from the general interest offered by any system of scientific thought. It has been said repeatedly that psychoanalysis is essentially a system of dialectic. Its *modus operandi* consists principally in various modalities of talking. Even its therapeutic applications have been named "talking cures". What more natural than that philosophers with a penchant toward dialectic, and those who have unfortunately forgotten or never learned the Platonic distinction between dialectic and eristic, should find in psychoanalysis interesting if not congenial material for consideration? It seems just as natural that to such thinkers this aspect of the system obscures some of the psychoanalytic processes of reasoning which constitute interesting problems in experimental logic, particularly from the instrumental point of view. Indeed, the methods of control and proof used by the psychoanalysts have received relatively little attention from philosophers, perhaps because of the highly technical and specialized procedures involved; although their conclusions have often been accepted and treated like those of any scientific investigation.

Many of the works of Freud and of his disciples, as well as of the heretical followers of Adler and Jung, read remarkably like those anecdotic and discursive treatises on psychology of the eighteenth century writers; who delightfully set forth hypotheses, tested and proved them and performed experiments wittily, all on paper of course, such as Hartley, Condillac, Bonnet, even Hume. Since then, psychology, aspiring to be a true experimental science, has taken to heart the arduous lesson of its elder and perhaps less charming sisters, the physical sciences: that, no matter to what perfection reason and imagination may attain, they are still insufficient to test a hypothesis.

While the Freudians claim to have subjected their hypotheses to a number of different ways of proving them, careful examination reveals that a good proportion of the evidence offered is of an anecdotic and imaginative quality and, of course, as empirically untested as that of the early animal and child psychologists. It exists merely as a verbal claim and as a precious demonstration of the "will to believe," in this case the will to believe that they are truly using a logical and scientific method. Such is the evidence derived from errors, slips, forgetfulness and dreams. It is made

up of observations which, in any other science, or even in other branches of psychology, would be considered suitable to suggest hypotheses, but certainly not to control them.

The psychoanalyses of neuroses, though more systematic and extended, are open to the same criticism. This method of observation has but one check on its accuracy: the association test. But this test, which requires careful planning and rigorous timing, is rarely applied in its accurate form. And most of the interpretations of the meanings of dreams, slips, amnesias, neurotic symptoms and the like, are simply picturesque and possibly inaccurate guesses of the analysts. It may be claimed that with sufficient experience the astute analyst learns to make accurate guesses. Perhaps. But if this be so, such guesses presented as clinical observations surely can never serve as acceptable evidence for the control of a hypothesis.

Now even when the association test is rigorously applied all that it can logically reveal is a connection of some sort between the response which is being investigated (dream, symptom, etc.), and the response to the diagnostic association words. It cannot indicate at what moment in the person's life history the association was established, nor *a fortiori* the possibility of a causal relation between the two responses. This test itself then does not obviate the analyst's guess as to the meaning or connection of the responses under investigation. It does not render this guess any the less a hypothesis, nor does it diminish the need for its empirical control.

The direct experimental test of psychoanalytic hypotheses is made practically impossible by the nature of the material. For these hypotheses can apply only to man; animal experimentation is out of the question. And their conditions are precisely those subtle elements of human contacts, education and emotional life, which cannot be reproduced in any laboratory so far conceived. Furthermore, they must frequently operate over a long time, years, a whole life-time, or even several life-times. Such material is at least as refractory to experimental study as, say, human heredity would be without the information obtained from the study of heredity in other organisms.

But there remains one test which the psychoanalyst would be very loth to relinquish—the therapeutic test. "By applying our doctrines we accomplish cures" is the constant cry of the psychoanalysts. It is indeed a test of peculiar interest to the philosopher as well as the psychologist, not only as a particular form of the empirical test but as an example of a specifically teleological instrumental test. It constitutes the very type of such a test. To the pragmatist a hypothesis has not been finally tested until it can be successfully used toward some end in practical life. Now obviously curing disease is eminently such an end. Yet such tests, unless used with the utmost care and subjected to a strict internal logical overhauling, can be extremely misleading. The possibility of the careless use of such tests is surely at the basis of much of the adverse criticism

of pragmatism. Dewey himself has insisted on the logical requirements of an instrumental test. They are instances of the general requirements of any empirical test of a hypothesis. But they often involve special obstacles to overcome. The control of an instrumental test is often difficult. This is particularly the case with the therapeutic test. The usual control devices of scientific experiments, such as matching groups, are inapplicable because of the psychoanalyst's responsibility toward the patient. Moreover, in the case of psychoanalysis, a host of technical obstacles would render unfeasible such a procedure. Matching groups satisfactorily is extremely difficult where the factors are so complex and interact so intensely with one another as in the affective processes of man. Even if this could be accomplished, it would be, at least in most cases, impossible to vary the factors which are being tested; for the same procedures are used to obtain information concerning the subject's psychic make-up and history, and to treat the neurosis. Statistical checks are inapplicable because no satisfactory methods have so far been devised for measuring the factors and the results.

Freud's general hypothesis about the origin of the psycho-neuroses[1] can be stated as follows. First, a given situation (stimulus) in the life of the person provokes a more or less permanent psychic state, made up of one or more repressed (unconscious) complexes. Second, this state in turn brings about, after the passage of a variable length of time, often years, certain external manifestations or reactions called symptoms.

The therapeutic test consists in carrying out certain manœuvres by which the psychic state is modified; the repression of the given complex ceases and the complex becomes conscious. If then the symptom disappears, this is considered an empirical proof of the hypothesis. It will be noted that such a test could, at its best, prove the second part of the hypothesis, never the first. A therapeutic test can obviously not be valid for a given factor unless that factor is still acting at the time the treatment is applied and unless the treatment is specific for that factor. With respect to its specificity there are two possible cases. First, the treatment removes only the factor to be tested, without modifying any other factors which might possibly influence the appearance of the symptom. Second, the treatment also modifies other factors in addition to the one being studied.

In the latter case it is possible to apply the therapeutic test provided there is a sufficient number of control cases in which it would be feasible to modify all the factors except the one to be studied, in the same way as in the treatment itself. If the symptoms disappeared in only those cases where the given factor was removed the

[1] A somewhat different hypothesis that applies to another group of neuroses, the "actual neuroses," as Freud calls them, I cannot consider here. According to Freud these are rare in their pure forms and are more often associated with the psycho-neuroses.

conclusion in favour of the hypothesis would be valid. There is no doubt that psychoanalysis comes under the second case. The highly complex and prolonged therapeutic situation with its transference, its active and passive therapy admittedly affects many factors at once. The practical impossibility of controlling factors in this situation I have already pointed out. Yet to assure the researcher of this specific application of the test, a particularly strict measure of control would be required: the control of all variable factors except the one to be studied.

Added to all these difficulties, the successful treatment of psychoneurotic reactions is claimed by other schools of psychotherapy for their respective methods, such as non-Freudian psychoanalysis, Christian Science, New Thought, individual psychology, auto- and heterosuggestion, persuasion, various schemes of re-education, hypnotism. As each school has its own theories about the genesis of the disturbances it treats, and with earnest triumph points to the cures it has accomplished as proof of its theories, the value of the therapeutic test applied to this material becomes even more doubtful. For the various theories, all of them contradicting one another in fundamental features, cannot all be held proven. When one considers that the suggestionists maintain that all the good done by psychoanalysis is really due to the suggestion incidental to the analysis, while the Freudians maintain that whatever good suggestion can achieve is really the work of such factors as transference and the liberation of complexes, unwittingly used, it seems that one has ventured into an inextricable morass of poorly defined terms and empirically unprovable propositions. The oft repeated argument that when psychoanalysis fails it does not disprove psychoanalysis is naïve, for likewise, if psychoanalysis appears to work it does not prove psychoanalysis.

In conclusion it can be said that most of the weight of the proof of psychoanalysis is thrown upon dialectic rather than experience. While neither Freud nor his disciples seem to have taken cognizance of the instrumental theories of epistemology, and none of them (so far as I can ascertain) is an averred pragmatist, they have used teleological applications to social practice as a test of their hypothesis. But this test has been applied in an uncritical way which might well be termed naïve pragmatism. The apparent instrumental value of this procedure seems so convincing that careful logical analysis of its conditions tends to be neglected. Such analysis shows once more that instrumental scientific logic gives no easy access to knowledge, but requires as rigorous and thoroughgoing logical analysis as any method.[1]

[1] I have deemed it unnecessary to give specific examples. They can be found abundantly in the voluminous writings of Freud, Ferenczi, Jung, Adler, Jones, or in the psychoanalytical periodicals.

D. B. Duff.

V.—CRITICAL NOTICES.

Process and Reality : An Essay in Cosmology. By A. N. WHITEHEAD. Gifford Lectures delivered in the University of Edinburgh during the Session 1927-28. Cambridge University Press, 1929. Pp. xxiii + 509. 18s.

IN these *Gifford Lectures* Prof. Whitehead has given us the " more complete metaphysical study " to which reference was made in the preface to the second edition of *The Principles of Natural Knowledge* and of which an outline was suggested in *Science and the Modern World*. The book makes extraordinarily difficult reading. This is not entirely Prof. Whitehead's fault. A comprehensive metaphysic cannot fail to be difficult, and Prof. Whitehead is determined to avoid the dangers of specialism by including in his Cosmology " all particular topics ". But the difficulty is undoubtedly increased by the obscurity of Prof. Whitehead's style, by his queer choice of words, and by his failure to provide definite examples elucidating his main conceptions. A further difficulty arises from the fact that Prof. Whitehead has come to hold views inconsistent with his earlier views, which, however, he has never explicitly abandoned. The most important change in his views relates to the fundamental distinction between objects and events. There is a less unintelligible change in his view with regard to the relation of mind to nature. Some indication of the reasons for these changes of view might have aided us to see why Prof. Whitehead holds the views that he now holds, and what exactly he takes to be their implications. But there is no such indication.

Prof. Whitehead states clearly in the *Preface* that the motive leading him to write this book lies in his belief that " the movement of historical and philosophical criticism of detached questions, which on the whole has dominated the last two centuries, has done its work, and requires to be supplemented by a more sustained effort of constructive thought " (p. ix). Accordingly it is his intention " to state a condensed scheme of cosmological ideas, to develop their meaning by confrontation with the various topics of experience, and finally to elaborate an adequate cosmology in terms of which all particular topics find their inter-connexions " (p. vi). Such an effort of constructive thought rests upon the assumption that speculative philosophy is both possible and important. Prof. Whitehead's book can be rightly judged only if it be approached

from this point of view. (Those who believe that the proper work of philosophy consists in the detailed, critical investigation of particular problems will but waste their time if they attempt to read this book.) The first essential is to attempt to understand Whitehead's conception of the nature and importance of speculative philosophy, to the consideration of which he devotes the first chapter. "Speculative Philosophy", he says, "is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted" (p. 1). He maintains that all constructive thought in the sciences is dominated by unacknowledged speculative schemes. There is considerable truth in this contention. The most dogmatic metaphysicians are usually to be found among the "pure scientists" who frequently profess to repudiate metaphysics. Thus there is something to be said for Whitehead's contention that the philosopher should attempt to make such schemes explicit in order that they may be criticised and improved. In the present work, however, Prof. Whitehead is concerned to construct his own scheme. He fully recognises that the formulation of such a scheme must be tentative. It would be unreasonable to criticise Prof. Whitehead's cosmology on the ground that it is neither complete nor final. But we surely have a right to expect that his *interpretation* of his constructive scheme should be detailed and clear, for only so could it be shown to be adequate to, and applicable to, experience. The exposition, however, is not clear, and it is not detailed but only comprehensive. (This combination of lack of detail with comprehensiveness of outlook makes the book impossible to summarise and extraordinarily difficult to criticise.) To attempt to do either properly would require a volume of *Mind*, and would in any case be beyond my powers. I can, therefore, only attempt to point out what appear to me to be some of the more important contentions, and to consider the outcome of this "essay in cosmology" in the light of Prof. Whitehead's earlier contributions to philosophy. Even with regard to this attempt I feel considerable hesitation since I am quite sure that I have often misunderstood what Prof. Whitehead wants to say. The language in which nearly the whole of the book is written is extraordinarily obscure. Prof. Whitehead himself would have but scant sympathy with the complaint that his choice of words is queer and that his expressions are obscure. He insists upon the unfitness of language for the purposes of metaphysics. "Words and phrases", he says, "must be stretched towards a generality foreign to their ordinary usage; and however such elements of language be stabilised as technicalities, they remain metaphors mutely appealing for an imaginative leap" (p. 4). Those who, like myself, are unable to make such an imaginative leap are bound to be baffled by his use of such ordinary words as "God", "feeling", "valuation", and sometimes to find whole sections unintelligible.

At the outset Prof. Whitehead lays down as the ideal of

speculative philosophy that " its fundamental notions shall not seem capable of abstraction from each other. In other words, it is presupposed that no entity can be conceived in complete abstraction from the system of the universe, and that it is the business of speculative philosophy to exhibit this truth " (p. 1). This statement is susceptible of two different interpretations of which one would reduce the presupposition to a simple truism whereas the other would involve a highly disputable dogma. According to the former interpretation the presupposition would amount to nothing more than the assertion that anything out of relation to *everything* else would be not only unknown but also unknowable, and as such would never be the concern of philosophy. So much everyone must grant, but nothing whatever follows from this admission. According to the second interpretation the presupposition would amount to the assertion that everything is in *essential* relations with everything else. This is equivalent to the assertion that reality is a highly coherent system. The statement, " it is presupposed that no entity can be conceived in complete abstraction from the system of the universe " would most naturally suggest only the first interpretation; it thus appears obvious. But Whitehead certainly intends it to be interpreted in the second way, and he does not seem to recognise that so interpreted this presupposition requires some justification. On the contrary, his system is based upon it. This system is called " the philosophy of organism ". He declares: " The coherence, which the system seeks to preserve, is the discovery that the process, or concrescence, of any one actual entity involves the other actual entities among its components. In this way the obvious solidarity of the world receives its explanation " (p. 9). To me, at least, the " solidarity of the world " does not express an obvious fact. It is, however, this fact which the philosophy of organism is invoked to explain.

Prof. Whitehead seeks " to base philosophical thought upon the most concrete elements in our experience ". For this purpose he selects three notions—" actual entity ", " prehension ", " nexus ". These are the first three of eight Categories of Existence, of which the fifth is " Eternal Objects ". Actual entities and eternal objects are said to " stand out with a certain extreme finality. The other types of existence have a certain intermediate character " (p. 29). In terms of the first three Categories of Existence he formulates twenty-seven " Categories of Explanation " and nine " Categoreal Obligations ". It is not possible here to refer to each of these. Their bare statement occupies eight pages which even Prof. Whitehead admits to be unintelligible apart from the rest of the book. It must be sufficient to refer only to those to which the most importance appears to be attached. There is a statement in the *Preface* which suggests the most important notions. " The positive doctrine of these lectures ", says Prof. Whitehead, " is concerned with the becoming, the being, and the relatedness

of 'actual entities'. . . . All relatedness has its foundation in the relatedness of actualities; and such relatedness is wholly concerned with the appropriation of the dead by the living—that is to say, with 'objective immortality' whereby what is divested of its own living immediacy becomes a real component in other living immediacies of becoming. This is the doctrine that the creative advance of the world is the becoming, the perishing, and the objective immortalities of those things which jointly constitute *stubborn fact*" (p. viii). To understand the philosophy of organism, summed up in this passage, it is first necessary to understand what exactly is meant by "actual entity", "prehension", "nexus", and "God". Some attempt must be made to explain these notions.

'Actual entities', which are also called 'actual occasions', are said to be "the final real things of which the world is made up. There is no going behind actual entities to find anything more real. They differ among themselves: God is an actual entity, and so is the most trivial puff of existence in far off empty space. But, though there are gradations of importance, and diversities of function, yet in the principles which actuality exemplifies all are on the same level. The final facts are, all alike, actual entities; and these actual entities are drops of experience, complex and interdependent" (p. 24). The complexity of an actual entity is due to the fact that every actual entity prehends all other actual entities, so that an actual entity α is a real component of another actual entity β. An actual entity is a concrescence, *i.e.* a growing together, of diverse elements. It is apparently for this reason that an actual occasion is called an "organism".[1] By "prehension", therefore, Whitehead seems to mean the definite way in which an actual occasion β includes other occasions in its concrescence. Accordingly the togethernesses of actual entities are real individual facts, "which are real, individual, and particular, in the same sense in which actual entities and the prehensions are real, individual, and particular" (p. 26). Such a particular fact of togetherness is called a 'nexus' (plural form is nexūs). The distinction between a nexus and a prehension is not made very clear, but in the list of the eight Categories of Existence prehensions are said to be Concrete Facts of Relatedness, and nexūs are said to be Public Matters of Fact. Every prehension consists of three factors: (i) the subject prehending; (ii) the 'datum' prehended; (iii) the 'subjective form'. By the 'subjective form' is meant "*how* that subject prehends that datum" (p. 31). When the data prehended are actual occasions the prehension is called "physical prehension"; when the data are eternal objects the prehension is called "conceptual prehension". Neither form necessarily involves consciousness. Prehensions may also be

[1] Characteristically Prof. Whitehead nowhere *defines* "organism", nor does the word itself appear in the index. As is usual in Professor Whitehead's books, the index is quite inadequate and is not free from misprints.

distinguished into positive and negative prehensions. Positive prehensions are called "feelings", and by "feeling" is apparently meant "blind physical perceptivity". Negative prehensions are said to involve 'elimination from feeling'. The point of the introduction of negative prehensions seems to be that it enables Whitehead to maintain that every item in the universe is prehended, negatively or positively, by every actual occasion. But his account of negative prehensions is so unclear that I cannot attempt to discuss it.

The doctrine of *objective immortality* depends upon the conception of 'positive prehension' or 'feeling'. Whitehead insists that actual entities must not be regarded as unchanging subjects of change. An actual entity is both the subject experiencing and also what he calls the "superject" of its experiences. Thus, "it is subject-superject, and neither half of this description can for a moment be lost sight of" (p. 39). As *subject* an actual entity is "perpetually perishing": as *superject* it is "objectively immortal". Thus Whitehead says: "An actual entity is to be conceived both as subject presiding over its own immediacy of becoming, and a superject which is the atomic creature exercising its function of objective immortality" (p. 61). This appears to mean that an actual occasion α in perishing is objectified in an actual occasion β, in that α becomes a constitutive element in the concrescence of β. Thus each occasion α is immortal throughout its future, and β has to conform to α. The word 'objective' in the phrase 'objective immortality' is used in the sense which it bears in the Cartesian phrase '*realitas objectiva*'. The conception of objective immortality results from Whitehead's fourth Category of Explanation, which he calls the "principle of relativity", and which he formulates as follows: "that the potentiality for being an element in a real concrescence of many entities into one actuality, is the one general metaphysical character attaching to all entities, actual and non-actual; and that every item in its universe is involved in each concrescence. In other words, it belongs to the nature of a 'being' that it is a potential for every 'becoming'" (p. 30). The ninth Category of Explanation—called the 'principle of process'—states, "That *how* an actual entity *becomes* constitutes *what* that actual entity *is*"; consequently, "its 'being' is constituted by its 'becoming'" (p. 31). This qualification of one actual entity by other actual entities is said to be "the 'experience' of the actual world enjoyed by that actual entity, as subject" (p. 233). Further, Prof. Whitehead asserts that the philosophy of organism accepts what he calls "the reformed subjectivist principle", namely, "that apart from the experiences of subjects there is nothing, nothing, nothing, bare nothingness" (p. 234). This is said to be an alternative statement of the 'principle of relativity'. From this principle there would seem to follow another principle of which Whitehead makes considerable use, and which he calls

the 'ontological principle'.[1] This is stated in the eighteenth Category of Explanation as follows: "That every condition to which the process of becoming conforms in any particular instance, has its reason *either* in the character of some actual entity in the actual world of that concrescence, *or* in the character of the subject which is in process of concrescence" (p. 33). This is said to mean that "actual entities are the only *reasons;* so that to search for a *reason* is to search for one or more actual entities". Whitehead accordingly also calls this ontological principle the 'principle of efficient, and final, causation'.

The application of the principle of relativity and the ontological principle—and the resultant doctrine of objective immortality—appears to make havoc of the fundamental distinction between *universals* and *particulars*, which Whitehead formerly recognised in his distinction between *objects* and *events*. He now states explicitly his reason for preferring the latter pair of terms to the former. The passage is so important that it must be quoted in full:

> "The ontological principle, and the wider doctrine of universal relativity, on which the present metaphysical discussion is founded, blur the sharp distinction between what is universal and what is particular. The notion of a universal is of that which can enter into the description of many particulars; whereas the notion of a particular is that it is described by universals, and does not itself enter into the description of any other particular. According to the doctrine of relativity, which is the basis of the metaphysical system of the present lectures, both these notions involve a misconception. An actual entity cannot be described, even inadequately, by universals; because other actual entities do enter into the description of any one actual entity. Thus every so-called 'universal' is particular in the sense of being just what it is, diverse from everything else; and every so-called 'particular' is universal in the sense of entering into the constitutions of other actual entities" (p. 66).

This seems to me a great muddle. It is surely extraordinarily confusing to say that a universal is a particular *because* it is "diverse from everything else". The recognition of the diversity of universals (or eternal objects) was stated by Whitehead in *Science and the Modern World* in terms of a principle called "The Translucency of Realisation". This was said to mean that "any eternal object is just itself in whatever mode of realisation it is involved. There can be no distortion of the individual essence without thereby producing a different eternal object" (*loc. cit.*, p. 240). This

[1] It should be observed that the twenty-seven Categories of Explanation are not mutually independent. It is difficult to see why Prof. Whitehead selects just those which he does select.

principle is not mentioned in the present book; instead we have the statement that a 'universal' is 'particular' *because* it is "diverse from everything else". This statement seems to me to involve a sheer misuse of language. The doctrine now expounded is inconsistent with Whitehead's former conception of the nature of objects and of events. In the *Concept of Nature* Whitehead says:

> "Objects are elements in nature which do not pass. The awareness of an object as some factor not sharing in the passage of nature is what I call 'recognition'. It is impossible to recognise an event, because an event is essentially distinct from every other event. Recognition is an awareness of sameness. . . . An object is an ingredient in the character of some event. In fact the character of an event is nothing but the objects which are ingredient in it and the ways in which those objects make their ingression into the event. Thus the theory of objects is the theory of the comparison of events. Events are only comparable because they body forth permanences. We are comparing objects in events whenever we can say, 'there it is again'. Objects are the elements in nature which can 'be again'" (*loc. cit.*, pp. 143-144).

This passage (and others both in *The Concept of Nature* and in *The Principles of Natural Knowledge*) certainly recognises that there is a fundamental distinction between objects and events. Identity could be recognised amid the diversities of actual entities, or events, because of the ingression into these events of objects which could 'be again'. Throughout these two books objects were conceived as accounting for identity, repetition, permanence, universality and abstractness. But according to Whitehead's present doctrine the identity of diverse actual occasions appears to be due to the objectification of one actual occasion in another actual occasion. It seems to be an inadequate description of this doctrine to say that its result is to "blur the sharp distinction" between universals and particulars. It surely involves the denial that there is *any* fundamental distinction between an eternal object and an actual entity, and is difficult to reconcile with the statement, already quoted, that "actual entities and eternal objects stand out with a certain extreme finality". It is true that it is not in its character of an immediate, *existential* entity that an actual occasion is regarded as entering into the 'constitution' of another actual occasion. On the contrary, Whitehead is as concerned to maintain that actual occasions are perishing particulars as that they are immortal. He insists that "an actual entity has 'perished' when it is complete" (p. 113), and that "its birth is its end" (p. 111). These statements agree with his former view that an event is "essentially passing". But he wishes now to insist that the actual entity "perishes *and* is immortal" (p. 113). The perished actual entity is immortal because—as he immediately goes on to say—"The actual entities

beyond it can say, 'it is mine'. But the possession imposes conformation". But 'conformation' is also called 're-enaction' and 'reproduction,' and Whitehead makes it clear that *what* is reproduced is an actual occasion, which, in its capacity of superject, enters into the constitution of other actual entities. Also, permanence is due to reproduction. Thus Whitehead says: "In the world there is nothing static. But there is reproduction; and hence the permanence which is the result of order and the cause of it" (p. 337).

Whitehead's philosophy of organism is conceived as providing a reconciliation of permanence with "the inescapable flux" (p. 296). This reconciliation, according to the new doctrine, seems to be brought about by means of the actual entities themselves. But since *as perishing particulars* the actual entities cannot 'be again', or, as Whitehead now prefers to put it, 'abide', and yet *as immortal* they do abide, it would seem to follow that actual entities must now be conceived as capable of taking the place of eternal objects. They are to be made to account for identity, repetition, permanence, and universality. They are also now conceived as sharing with eternal objects the characteristic of being abstract. They acquire this characteristic in becoming objectified. Thus Whitehead says: "The objectified particular occasions together have the unity of a datum for the creative concrescence. But in acquiring this measure of connexion, their inherent presuppositions of each other eliminate certain elements in their constitutions, and elicit into relevance other elements. Thus objectification is an operation of mutually adjusted abstraction, or elimination, whereby the many occasions of the actual world become one complex datum" (p. 299). It would seem, then, that there is no function performed by eternal objects that is not also performed by actual entities. If this be so, it is difficult to see why eternal objects should be retained. But it was just this sharp distinction between objects and events, upon which Whitehead formerly insisted, that seemed, to me at least, one great merit of his earlier Naturphilosophie. Various inconsistencies that were apparent in *Science and the Modern World* may perhaps be taken as signs that Whitehead, in writing that book, was passing from his earlier theory to his present exceptionally obscure philosophy. Those who have reproached Whitehead for protesting against the "bifurcation of Nature" whilst himself admitting a "bifurcation" of events and objects have, no doubt, reason to be pleased with his latest development of the philosophy of organism. For my part, I have never been able to see that the repudiation of the former doctrine should entail the denial of any ultimate distinctions, and I can only regard Prof. Whitehead's present position as deplorable.

The denial of the doctrine that Nature is closed to mind is, however, inconsistent with the rejection of the bifurcation of Nature. This at least Whitehead seems to have maintained in his earlier

writing, in spite of some obscurities and vacillation in his view with regard to the nature of mind and its relation to passage.[1] It is clear that Whitehead does now deny that Nature is closed to mind. So much was apparent in *Symbolism: its Meanings and Effect*. The present work puts the denial beyond doubt. Prof. Whitehead should, then, now hold that his former protests against "the bifurcation theories" were mistaken. But on this subject he makes no explicit pronouncement. Again, the distinctions, once so carefully drawn, between 'scientific objects', 'perceptual objects', and 'sense-objects' would now appear to be worthless in view of his present insistence upon "enduring objects". Mr. Braithwaite, in reviewing *Science and the Modern World* [2] pointed out the difficulties in Whitehead's treatment of "enduring objects". These difficulties have but become more acute with the collapse of the ultimate distinction between objects and events.

It is not to be supposed that Prof. Whitehead would himself admit that this collapse has occurred. On the contrary there are numerous passages in which he reaffirms the distinction. But there are other passages in which it seems clearly to be denied. The whole doctrine of objective immortality, as I have tried to show, renders the distinction valueless. That Whitehead himself is unaware of his vacillation on this point seems to be due to his conception of God. In this conception all the difficulties of his philosophy come to a head. God is an actual entity, but he is a non-temporal actuality. Apart from God the eternal objects would be a multiplicity of disjoined bare potentialities. But according to the ontological principle such a multiplicity of potentialities is impossible. Consequently Whitehead makes this multiplicity of potentialities actual by placing it in the non-temporal actuality, 'God,' which is then called "God's primordial nature". The reconciliation of permanence and flux is called "God's consequent nature". Thus Whitehead says, "The primordial created fact is the unconditioned conceptual valuation of the entire multiplicity of eternal objects" (p. 42). Again, "The consequent nature of God is the fluent world become 'everlasting' by its objective immortality in God" (p. 491). Thus in God there is combined "creative advance with the retention of mutual immediacy" (p. 489). Through his primordial nature God is 'the principle of concretion'; through his consequent nature he "saves the world as it passes into the immediacy of his own life". The relation of God to the world is summed up in seven contradictions, which are said by Whitehead to be "antitheses". There is truth in Whitehead's own comment: "The concept of 'God' is the way in which we understand this incredible fact—that what cannot be, yet is" (p. 495). He seems to have forgotten his own warning

[1] I dealt with this difficulty in an article on "Mind and Nature in Professor Whitehead's Philosophy," in MIND, July, 1924.

[2] See MIND, October, 1926.

that "God is not to be treated as an exception to all metaphysical principles, invoked to save their collapse" (p. 486).

Prof. Whitehead's indefensible usage of language becomes nothing short of scandalous when he speaks of 'God'. He says that 'God' is a term used for "Creativity", "Aristotelian 'matter'", "modern 'neutral stuff'", since "the contemplation of our natures as enjoying real feelings derived from the timeless source of all order, acquires that 'subjective form' of refreshment and companionship at which religions aim" (p. 43). This statement is odd enough, but when he goes on to speak of God's "infinite patience", of God as "tenderly saving the turmoil of the intermediate world", of God as being "the poet of the world, with tender patience leading it by his vision of truth, beauty, and goodness", we are forced to conclude that the use of the familiar name has beguiled Prof. Whitehead into forgetfulness of the part he has assigned to the non-temporal actuality which he chooses to call "God". It is difficult to acquit Prof. Whitehead of a deliberate desire to encourage the unclear thinking that is so common with regard to this subject. It is much to be regretted that a writer of his eminence should even appear to lay himself open to such a charge.

The length of this book, the difficulty of Prof. Whitehead's thought, and the confusion in his expression of it have led me to write a review that is already too long, and yet much that is of the greatest importance has been passed over in silence. This is, however, inevitable. The doctrines I have dealt with are fundamental to his philosophy, so that no part of it can be explained unless these are first understood. This is the case even with regard to the theory of extension, expounded in Part IV., which is the easiest part of the book. By using Prof. de Laguna's notion of "extensive connection" instead of the relation of "whole and part", Whitehead has been able to give a more satisfactory account of the method of extensive abstraction. In the short space left to me I must confine myself to calling attention to this improvement, and to pointing out other topics of interest in other parts of the book. Prof. Whitehead has made clearer than he did before the theory of symbolic reference as the interplay between presentational immediacy and causal efficacy. With regard to Locke and Hume he has much to say that is illuminating and important, and upon which I should like to have been able to comment.

If one attempts to consider the book as a whole one is faced with the problem of its significance. That it is obscure no one can doubt. That it is worth pondering I am convinced. Whether it is the product of thinking that is essentially unclear but capable of brief flashes of penetrating insight; or whether it is too profound in its thought to be judged by this generation, I do not know. Reluctantly I am inclined to accept the first alternative.

L. SUSAN STEBBING.

Philosophical Theology, Vol. II.: The World, the Soul, and God. By F. R. TENNANT. Cambridge University Press, 1930. Pp. xiv, 276. 15s.

IN this book Dr. Tennant completes the task which he began in the first volume, published last year under the title of *The Soul and its Faculties*. That was occupied mainly with general questions of psychology, epistemology, metaphysics, and ethics; this contains the application of the results there achieved to the establishment, defence, and delimitation of theism. The author justly claims that the characteristic conclusions of the first volume were reached by impartial reflexion on facts open to everyone's inspection, and were not specially sought out and selected in order to form the premises of a theistic conclusion. Certainly Dr. Tennant, the philosopher, cannot fairly be accused of making things too easy for Dr. Tennant the theologian. All theistic arguments which make use of *à priori* premises, or which start from purely ethical data, have already been rejected; and all claims to direct acquaintance with God in mystical or religious experience have been set aside as unproven. So we are left with some form of the *Argument from Design* as our only resource.

The book falls into five main divisions. Theism is to be defended as being, on the whole, the 'most reasonable explanation' of the world when *all* the known facts are fairly taken into account. So we begin by arguing that the world does demand some kind of 'explanation'; that it is not self-explanatory; and that the kind and degree of 'explanation' given by natural science is not adequate. In connexion with this part of the argument Dr. Tennant finds it necessary to distinguish different senses which have been given to 'explanation' and to the statement that the world is 'rational'. This first division is contained in Chapters I. to III. inclusive. Chapter IV., entitled *The Empirical Approach to Theism: Cosmic Teleology*, constitutes the second division. It contains the argument that the theistic hypothesis does provide an explanation of the kind required. The third division consists of Chapters V. and VI., on the *Idea of God*. In these Dr. Tennant discusses a number of honorific titles, such as 'creative', 'eternal', 'infinite', 'perfect', etc., which theists have been wont to ascribe to God; and considers what precise 'cash-value' an empirical theologian, like himself, can allow to them. He also discusses the notion of divine personality, and the limitations which this imposes on God. The most serious objection to any kind of theism is of course the amount and distribution of evil in the world. Dr. Tennant deals with the *Problem of Evil* in Chapter VII.; and this chapter forms the fourth main division of the book. In Chapter VIII., on *Divine Immanence and Revelation*, the author discusses the various senses of 'immanence' and of 'revelation'; the relation between the two; and, in connexion with alleged revelations of truths above reason, certain specifically Christian mysteries,

such as the Incarnation. This may be taken as the fifth and last main division. The last chapter—*God, the Self, and the World*—is a recapitulation of the argument and results of the two volumes. There is also an *Appendix*, consisting of five notes in which certain subjects mentioned in the text are more fully treated. This includes notes on the doctrine of the *Trinity* and on *Immortality*. I will now say something further about each of the five chief topics of the book.

Chapter I. is concerned with Natural Laws and the conformity of the world to them. The suggestion, made in various forms by Kant, by Prof. Karl Pearson, and by Prof. Eddington, that the appearance of regularity in the outer world is wholly read into, or imposed upon, lawless data by human observers, is rejected. The regularities which we find among our sensations must be transcriptions, though they may be subjectively tinted and distorted ones, of regularities among independent existents. On the other hand, we must not think of the laws of nature as having the kind of necessity which belongs to the laws of mathematics or logic. It appears from what Dr. Tennant says on page 22 that he distinguishes causal laws, as does Mr. Johnson, both from mathematical or logical laws and from mere statements of *de facto* regularity. 'If we rule out the *prius* of necessary law we must also rule out ungrounded coincidence. . . .' Again: 'Unvarying concomitance or sequence . . . points to Actual connexion and necessitation'.

Chapter II. contains a rather elaborate discussion of mechanical explanation and its connexion with natural laws. So far as I can see, the contention of this chapter is as follows. It has been claimed that mathematical physics gives us the whole truth and nothing but the truth about those existents which appear to us as matter. And it has been claimed that mathematical physics, when fully developed, teaches that these existents have only geometrical, kinematic, and kinetic properties. Dr. Tennant thinks that, if this were admitted, there would be nothing left in the external world to demand a theistic explanation. He has, of course, no difficulty in showing that the notion of 'mechanical explanation' is highly ambiguous; that, even when we confine ourselves to the inorganic, there is much that cannot be 'mechanically explained' unless that term be so stretched as to be almost meaningless; and that the existents which appear as matter, and appear to obey mechanical laws, may quite well have other characteristics and obey other laws in addition. There is nothing in the teachings of physics inconsistent with the view that the existents which appear as matter are minds or collections of minds.

In Chapter III. Dr. Tennant distinguishes the various senses in which 'explanation' has been used in science, and the sense in which natural theology claims to give an explanation of the world which science does not give. To 'explain' may mean (i) to reduce the unfamiliar to the already familiar, either in the sense of what

has already been perceived, or in the sense of what can easily be pictured on the basis of past perceptions. Or (ii) it may mean to state the concrete conditions which were antecedent to an event and which will have to be fulfilled again if a similar event is to be repeated. These are both rather crude kinds of explanation. (iii) The next sense of ' to explain ' is to reduce the facts to a form in which they can be grouped and handled by the methods of formal logic and mathematics. Under this head comes the attempt to reduce qualitative difference and change to mere arrangements and re-arrangements of qualitatively similar and qualitatively unchanging elements. Dr. Tennant regards our taste for this kind of explanation as a specifically human demand which the world cannot be trusted to satisfy without limit. (iv) Another sense of ' explanation ' is to elicit the noumenal originals of which the facts and laws recognised in daily life and science are projections distorted and tinged to some extent by personal or racial peculiarities. (v) There is a sense of ' explanation ' in which it means a description of a whole region of phenomena in the simplest and most workable set of symbols, without regard to whether the individual symbols correspond point for point to factors in the *explicandum*. Dr. Tennant argues that the assumption that the laws of nature must be simple is probably an unjustifiable extrapolation from the fact that the laws which were first discovered were simple, as indeed they must have been to be discernible in the infancy of science. (vi) When we come to biological phenomena it seems that new explanatory categories are needed, *e.g.*, emergence, inner teleology, etc. (vii) Finally, we have teleological explanation, in the strict sense; *i.e.* where we explain the existence of something by pointing out that it was foreseen, desired, and brought into being by an active intelligent mind. We know that this kind of explanation is applicable within human life and history, and that it gives us intellectual satisfaction. It is not incompatible with the other kinds of explanation, but it can be applied where they cannot. The world, taken as a whole, is certainly not completely explicable in any of the other six senses; it is the claim of natural theology that it is explicable in this seventh sense.

Dr. Tennant's argument in Chapter IV., which is the turning-point of the whole book, is as follows. From page 81 to page 103 he considers in turn five sets of facts, each of which has been held to furnish an adequate basis for a teleological argument for theism. These sets of facts are (i) the adaptation of human thought-processes to the objects with which they are concerned; (ii) the adaptation of parts to whole within each living organism; (iii) the adaptation of the inorganic world to the production, maintenance, and development of living organisms; (iv) the beauty and sublimity of nature; and (v) the facts of moral obligation, moral value, etc. He considers that, whilst none of these five sets of facts excludes a teleological explanation and whilst some of them rather definitely point to one, yet none of them taken by itself would suffice to make it unreasonable

to reject such an explanation. It is the co-existence and mutual connexion of all these facts which seems to demand the hypothesis of an intelligent over-ruling mind.

Dr. Tennant, of course, realises that there are objections to this kind of argument. He considers that the most serious is the suggested possibility that ' our ordered fragment may be but a temporary and casual episode in the history of the universe ' (p. 80). His answer is that the fragment is not isolable from the rest of the universe. ' It is because the desert is what it is that the oasis is what it is.' This is surely insufficient. The question is whether a universe of vast extent in time and space might not be reasonably expected to contain occasional small ' pockets ' in which the rather special conditions needed for the production and temporary flourishing of life and mind are realised, without deliberate design on the part of anyone. If holding the five best trumps be compared to an ' oasis ' and holding anything worse than this be compared to a ' desert ', it will be true that my ' oasis ' and the other players ' ' deserts ' are interdependent. Yet the ' oasis ' is not a product of design.

On page 88 Dr. Tennant deals with the objection that ' if the world be the sole instance of its kind . . . there can be no talk of . . . antecedent probability in connexion with our question '. His answer seems to be a *tu quoque* addressed to science and common-sense. We are concerned here, he says, ' not with mathematical probability . . . but the alogical probability which is the guide of life and which has been found to be the ultimate basis of all scientific induction.' And, at the bottom of the page, he suggests that each man's belief in the existence of his fellow-men is in the same logical position as the empirical theist's belief in God. To this I should be inclined to make the following answers.

(i) At best this argument could be used only to convict a dogmatically atheistic scientist of inconsistency. It would be of no avail against a sceptical philosopher who took the line that he could see no more logical justification for science than for theology, but found that in practice he could not help believing the results of the former and could quite easily help believing those of the latter. (ii) The Design Argument really makes *two* uses of the notion of antecedent probability. It has to contend both that it is antecedently *improbable* that the world should be such as it is *without* being the product of the design, and that the existence of a world-designer has an appreciable antecedent probability. Now, as regards the first point, I cannot see that Dr. Tennant has answered the objection by his distinction between ' mathematical ' and non-mathematical probability. Is there *any* sense of probability, mathematical or ' alogical,' in which a meaning can be attached to the statement that the antecedent probability of one constitution of the world as a whole is greater than or equal to or less than that of any other ? I very much doubt if there is. As regards the second point, Dr. Tennant's comparison with our belief in the existence of other human minds

seems hardly fair. I do know directly of the existence of at least one human mind, *viz.*, myself. I can see that it is the kind of existent of which there might be many instances. This does presumably give some finite antecedent probability to the hypothesis of the existence of other human minds. But I have no such grounds for assigning a finite antecedent probability to the existence of a single divine mind on which the whole world depends.

Dr. Tennant holds that we might be able to recognize that the world is probably the product of a designing intelligence without being able to conjecture what end is being pursued. But he thinks that the ethical data, which are inadequate by themselves to establish Theism, strongly suggest, when once Theism is established, that God's end in creation is the production and development of finite moral beings. The only instances of such beings with which we are acquainted are ourselves; and, to this extent, empirically established Theism is anthropocentric. In a footnote on page 114 Dr. Tennant seems prepared to accept the view of Prof. Eddington that life and mind may exist only in one or a few small regions in a vast lifeless universe. If so, it is difficult to see the relevance of enormously the greater part of the physical world to God's presumed intention. And, when stress is laid on the superabundant beauty of nature unspoilt by man, two questions arise. Is there the least reason to believe that the bulk of the stellar universe is any more beautiful than Wigan or the Sahara? And, if most of the ugliness that we know of is due to the large-scale operations of man, would it not be safer to argue from natural *ugliness* than from natural *beauty* to the existence of a mind which operates on a still larger scale?

The teleological argument is, of course, an argument by analogy with our own minds and their productions. The question therefore arises whether God, as designer of the world, could have enough analogy with us, who live and operate within the world, to make the argument a reasonably strong one. At the end of Chapter IV. and the beginning of Chapter V. Dr. Tennant considers the analogies and differences. At once a most serious difficulty arises. He insists (p. 122 *et seq.*), that God must be conceived as a *creator* who brings into existence genuine *continuants*, which afterwards live their own lives, and which are not mere rearrangements of pre-existing continuants. Now he admits that we have no such power ourselves and no clear conception of it. 'The notion of creation . . . is not derivable from experience.' (p. 125). This is a very awkward admission for anyone who is basing his argument for the existence of God on analogy with ourselves and our designs and operations. And it is particularly awkward for a writer, like Dr. Tennant, who insists that *all* our concepts are of empirical origin. I cannot imagine whence, on Dr. Tennant's view, the notion of creation can have come into the human mind. And I cannot see how a theory which has to use this concept can claim to be 'explanatory' in the sense in which a scientific theory or an historical reconstruction of a past

situation is 'explanatory'. Dr. Tennant attempts to deal with this latter objection on page 125; but I cannot see that he is successful. It may be that 'the ultimate mystery of the origination of the world confronts all theories alike'. But surely the essence of Dr. Tennant's defence of Theism is that it does, and rival theories do not, give an intellectually satisfactory explanation of this mystery. And, if it involves the admittedly unintelligible notion of creation, it is an unintelligible hypothesis supported by a superficial analogy which dissolves away when exposed to critical reflexion.

When Dr. Tennant goes into further details, as he does in Chapter V., the dissimilarities between 'design', as ascribed to God, and 'design' as known in men, become still more marked. We must not suppose that God's design existed before its execution, that God used means to bring about his proposed end, or in fact that God ever existed without the world existing too. 'If we are to speak in terms of time . . . the world is co-æval with God and is contingent on his determinate nature, inclusive of will' (p. 129).

Dr. Tennant's doctrine about time and eternity is summed up on page 139. God, being an existent, is certainly not eternal in the sense in which a truth or fact is so. And, if 'eternal' means 'lasting through endless time', it has no special significance for theology. Sometimes 'eternal' is used merely as an honorific expression of spiritual value; it then has no special reference either to duration or to timelessness. It is quite certain that the experiences of finite beings appear to have temporal qualities and relations. This appearance must be a manifestation of a certain characteristic kind of quality or relation among noumena. And there is no reason to think that the appearance misrepresents fundamentally the characteristics which it manifests.

Dr. Tennant points out the many ambiguities which lurk in the term 'infinite', and concludes that there is no sense in which it is both true and important to apply it to God. He deals also with the ambiguities of the terms 'perfect' and 'immutable'; and concludes that the only immutability which can be ascribed to God is immutability of purpose, and the only perfection which can be ascribed to God is moral perfection. But he admits that God's situation is so different from that of any finite being that 'his moral nature is largely incomparable with ours' (p. 148). It appears in fact that, when we assert that God is 'morally perfect', we are merely denying, under an affirmative verbal form, the presence in him of certain features, such as conflicting desires, which are *imperfections* in us. We are not asserting anything, so far as I can see, that has a clear positive meaning.

Chapter VI. begins with a severe, and, in my opinion, largely justified, attack on *à priori* speculative theology and metaphysics, as exemplified by Plato, Aristotle, Plotinus, and modern Absolute Idealists. McTaggart's pluralistic form of Absolutism is treated with rather more respect. But Dr. Tennant naturally cannot

accept its axioms or its general method of procedure; and he very much dislikes the doctrine, which is essential if McTaggart's conclusions are to be reconciled with the appearances, that we seriously misperceive ourselves and our mental processes when we introspect.

As regards the personality of God, Dr. Tennant holds that theology cannot decide whether God should be regarded as a single person or as a society of persons. But he thinks that one or other of these alternatives must and can be accepted, provided it is recognised that personality involves that degree of limitation which is implied by relation to an Other, which is not a mere part of, or occurrent in, the Self. Since Dr. Tennant makes God to be a creator of genuine continuants, which, when created, have lives and wills of their own, he has not the same difficulty as Lotze in providing God with the relatively independent Other which he needs in order to be a person.

The nature and limitations of God's knowledge are discussed in the latter part of Chapter VI. The argument is as follows. God cannot have a body, and therefore cannot perceive other things indirectly, as we do by means of their effects on our bodies which cause sensations in our minds. It is concluded that God has the same kind of direct acquaintance with the existents which appear to us as matter as we have with our own sense-data. But there is a further difference. An archangel might differ from us, and agree with God, to this extent. But there would remain the difference between him and God that God did, and the archangel did not, create the continuants with which he is now acquainted. In spite of these advantages God's knowledge is limited. He cannot experience the feelings, desires, etc. of his creatures, though he knows all about them. And, whilst he can *infer* anything that can be inferred, he cannot know in detail beforehand how any creature to which he has given free-will will use this gift. The notion that there might be non-inferential knowledge of events which have not yet happened seems to Dr. Tennant to be unintelligible. The only comment that I have to make on all this is that I do not see that it follows from anything else in Dr. Tennant's book that God has *no* body rather than that he has the *whole world* for his body. In the latter case his acquaintance with any object in the world would be analogous to our acquaintance with parts of our own bodies by organic sensation.

The *Problem of Evil* is dealt with in Chapter VII. It is certain that evil exists; this is 'knowable with much more immediacy and certainty than is the being of God' (p. 181). And all attempts to minimise evil by calling it merely negative are idle verbiage. In considering whether a better world than this was possible we must begin by stating what we mean by 'best'. Not all kinds of value are compatible. If 'best' means 'happiest' no defence can be made. But, if 'best' means 'most productive of good character and conduct', a case can be argued. As regards moral evil Dr. Tennant's defence is based essentially on the doctrine that the

highest kind of moral good is impossible without undetermined free-will. It was logically impossible to create a world having the highest kind of value without creating beings who are responsible for their deliberate choices. And such responsibility would be impossible unless they were free to choose evil as well as good. This leaves it possible that there will always be moral evil, and conceivable that it might someday become supreme. But the latter contingency seems most unlikely when we fairly reflect upon and compare the nature and consequences of moral good and moral evil. Dr. Tennant's defence of God on the score of physical evil is as follows. The world could not be a training place for the development of moral character unless it consisted of things with fixed properties subject to general laws. And it is impossible that the world should be of this nature without at times inflicting pain on innocent sentient beings. Such pain is not willed by God either as an end or as a means, but it is tolerated by him as an inevitable collateral consequence of the only conditions under which free agents can exercise their virtues and develop moral values. In outline the validity of this line of defence may be admitted; but, when we come to details, it is all a question of degree. Must *every* possible system of things with fixed properties and subject to general laws involve so widespread, so intense, so unjustly distributed, so useless, and so morally detrimental suffering as there seems to be in the actual world? He would be a bold man who would attempt to answer this question in the affirmative. Of course, if our present life be a short section of a life of much greater, or even endless, duration, there is at least a possibility that the problem of physical evil may be much less serious than it appears. This Dr. Tennant recognises on page 205, and discusses further in Note E. of the *Appendix*. He there concludes that 'the world . . . cannot safely be regarded as realising a *divine* purpose unless man's life continues after death'. Whilst I agree that theism without human survival can hardly be ethically satisfactory, I should conclude from this that we have no right to postulate the existence of an ethically satisfactory God *unless* and *until* we have some *independent* evidence for human survival. And Dr. Tennant denies that we have any such independent evidence.

I leave it to professional theologians to discuss the more strictly theological topics with which Dr. Tennant is concerned in Chapter VIII. I must end by congratulating Dr. Tennant on the completion of a solid and valuable treatise on a subject of perennial interest. I cannot, indeed, pretend to believe that ethical theism has been, or could be, established by such arguments as these. But, considering how heavily Dr. Tennant has felt obliged to handicap theism, he has certainly given it a very good run for its money. If a system of speculative philosophy cannot be established by Dr. Tennant's method, I agree that it is still less likely to be established by any other. Dr. Tennant's method at least ensures those who use it against nonsense, enthusiasm, and credulity; it leads to a form of

theism which is intellectually and morally respectable and in practice inoffensive; and, if one *must* try to explain the ultimate and formulate the ineffable, Dr. Tennant's type of conclusion is perhaps the least unintelligible explanation and the least misleading formulation available to us here and now.

C. D. BROAD.

Essays in Honor of John Dewey, on the occasion of his Seventieth Birthday, October 20, 1929. New York: Henry Holt & Co. Pp. xi, 425.

WILLIAM JAMES used, half seriously, to declare that most philosophers were secretly devoured by an ungratified craving for 'recognition', by which they meant *praise*. If there is truth in this contention, John Dewey must be the happiest of philosophers. For he has been praised without stint, and officially recognised as America's greatest living philosopher; and the great banquet tendered him in New York on the day he completed his three score years and ten was plainly intended as America's declaration of philosophic independence. If he were not among the most modest of men he might well be elated also at the celebration of his seventieth (that is, presumably, seventy-first) birthday by this stately volume. Its nine and twenty contributors (all former or present colleagues) all acclaim him as their friend, colleague, and in some sense, master; and even though their contributions (as might have been expected) vary considerably in interest and value, their average quality is high. It is moreover somewhat noticeable that all the essays are in some sense independent contributions to philosophy, and that none of the contributors is content to be a mere interpreter of his master's doctrine, or sets himself merely to expound or explain its difficulties. For this feature the reason may be only that it is neither safe nor profitable for any one to set up as a commentator till his subject (or victim) is *dead:* but still pragmatists do not seem to be capable of the faithful and so often pathetic discipularity of the Hegelian school. In the appended reflections I have not attempted to abstract and appraise all the essays, but have merely selected for comment arguments and points which impressed me specially.

Dr. Felix Adler leads off the (alphabetical) array with an essay on Personality, which agrees with Kant (though the author disclaims Kantism) that "every human being is an end *per se*" (p. 7). Next, Prof. E. S. Ames, of Chicago, discusses 'Religious Values and Philosophical Criticism' in a thoughtful and well-written essay which uses the social side of religion to bring out the need for a reconstruction also of the spiritual values under changing circumstances. Prof. Harold Chapman Brown of Stanford, in an essay

on 'Art, Action, and Affective States', takes the opportunity to question the 'disinterestedness' of art, and to condemn the American school system as destroying the capacity for the appreciation of art (p. 57).

Next, Prof. Burtt, of Chicago, raises as 'Two Basic Issues in the Problem of Meaning and of Truth' the questions whether (1) meaning can be determined quite objectively and without regard to the individual interested in asserting it, and (2) whether *any* kind of response obtained during an inquiry shall be regarded as relevant to its truth-claim. The first of these issues he considers "the clue to the essential epistemological difference between realism and pragmatism", while the second "marks the vital difference between the Jamesian and the Deweyan types of pragmatism" (p. 66). The realist is sanguine enough to assume that the mind can grasp objective reality, without distortion by subjective bias: the pragmatist realises that we may not begin by assuming that the observer's idiosyncrasy has made no difference to his observation. But the pragmatists are themselves to be divided further "on the problem of meaning and truth" (p. 71). "If what we are doing in relation to an object is part of its meaning, shall we say that any and every reaction thus occurring is to be taken as revealing its meaning?" If not, what limitations are to be recognised? Now science cannot, Prof. Burtt thinks, tolerate laxity upon this point. It must hold that "a meaning is something that can be determined in the same definite way for all minds, and a scientific truth is something that can be verified as such by any competent observer" (p. 74). Moreover, with "a theory of meaning or of truth which simply justifies this individualism, as James appears to do, we can make no social progress in our thinking" (*ibid.*). So truth and meaning *ought* to have universality, and this is an ethical postulate science ought to provide. Nevertheless it is "novel and important" for pragmatism to have reduced this "objective universality of meaning and truth" to "an ideal of logical value to be approximated rather than a factual structure to be claimed" (p. 79).

With this conclusion of Prof. Burtt's I find myself in cordial agreement; but it seems to me to cut the ground from underneath his previous contention that he had found a vital difference between the pragmatisms inspired by James and by Dewey. For on the one hand there is nothing in James's account of how human beings select their meanings and set to work to get truth to prevent them from going on till they arrive at agreements upon *common* meanings and truths: on the other hand insistence on the unity of scientific method is palpably inadequate, and in no wise helps them to do so. Prof. Burtt should have noted in the first place that though James concedes to every inquirer a right to adopt a truth satisfactory to himself he does not, on this account, *forbid* him to agree with any one else, and that men are normally so constituted that they take more satisfaction in truths they can share with others; secondly,

that faith in the abstract unity of scientific method really yields no means of deciding which party is right in a scientific *dispute*. Usually *both* parties rely equally upon scientific method, and are equally convinced that its verdict should be given in their favour. Actually both are probably influenced by bias, which in one case *at least* acts as a source of error. The dispute therefore cannot be decided in the abstract, nor by any appeal to scientific method; a decision can only be obtained by prosecuting the particular inquiry. Moreover it may easily be shown also that Prof. Burtt's doctrine is wrong upon the facts. Bias is and remains an ineradicable factor in all cognitive enterprises, and it is neither wise nor scientific to make believe that it has been eliminated. Thus the conflict between the conservative and the innovating bias enters into the interpretation of every scientific question; so does that between the optimist and the pessimist into every philosophic valuation. If therefore the use of scientific method really demanded a prior extirpation of bias, the cause of science would be lost. Actually, however, we contrive to make allowances for the various sorts of bias and the area of agreement slowly grows. It is not however good policy, either for science or for society, to try to force agreement by insisting on premature uniformity. We can, and do, "make social progress in our thinking," without tabooing individual experiments; and science, religion and politics all lose far more than they can gain by intolerance. So there is really neither paradox nor inconvenience in the admission that truth *a* may be true for A and truth *b* for B, and that A and B may fully understand the grounds for each belief, and may both be willing to admit it. We have merely to suppose that A is an optimist and B a pessimist, and that the final balance sheet of the universe is not yet made up!

In a short but striking paper Prof. J. J. Coss suggests that two desires underlie the construction of philosophies, that for 'consolation' and that for 'control', and that the latter has now become self-conscious. Miss Kate Gordon, of the University of California at Los Angeles, supplies a very neat example of the way in which the random assertions of *a priori* philosophers about matters susceptible of psychological testing may nowadays be called to account. She tried to verify empirically Kant's assertions that æsthetic differs from sensuous pleasure by its greater disinterestedness and universality. She selected 10 pictures of women's faces, ranging from actresses to blue stockings, and asked 200 persons (their sex is not stated) to arrange them in order of beauty, and then tabulated the results. A second set of tables was similarly compiled from judgments on the æsthetic quality of ten rectangles of equal area but different shapes, and a third on the pleasantness of odours, from lemon to asafœtida. The results ought to give a salutary shock to the *a priori* philosopher who excretes facts from his inner consciousness. The æsthetic judgment on feminine beauty showed considerable 'scattering', 57 being the largest number of first

choices obtained by any one face, while even the least favoured obtained 1 vote. Among odours there was much more objective agreement: for first place no one voted for tansy, creosote, valerian and asafœtida, while 84 voted for lemon. As for the rectangles, 49 put the golden section first, which was orthodox; but others obtained 34, 34, 29 and 21 votes. A majority (116) put the square last; but even so it was put first by 4. Miss Gordon concludes that "the agreeableness of odours is judged with greater uniformity than is the beauty of the rectangles or of the women's faces", and that there is no evidence to show that æsthetic judgments are more uniform or necessary than judgments of sense pleasure. After that 'disinterestedness' and 'universality' ought surely to be 'scratched'.

Richard McKeon's study of 'the Empiricist and Experimental Temper in the Middle Ages' brings out the interesting fact that both the words 'experiment' and 'experimenter', and "the fact of experimentation occurred first in the tradition of magic" (p. 224). Dr. E. C. Moore, the Director of the University of California at Los Angeles, discourses ably on 'What is meant by Social Activity?', emphasising that "the centres of initiation, the wells of energy, the existent beings are always individuals" (p. 279), and illustrating social co-operation by "the daily miracle of 10,000 automobiles keeping their distance and position and accomplishing their several errands almost without bloodshed upon the highways" (p. 278). Dr. J. H. Randall's 'Dualism in Metaphysics and Practical Philosophy' explains, *inter alia*, why the school of Dewey does not disdain to wear the label 'naturalism', being interested in all nature and finding no gulfs therein. But he comes perilously near to adopting the absolutist ideal of all-inclusiveness (p. 316) which stultifies all knowing by refusing to omit even the irrelevant, and admits that it is "a difficult practical problem to combine devotion to the transcendent values of science, art, morals, or religion, with a readiness to revise them in the light of their actual functioning in human experience" (p. 322).

Prof. H. W. Schneider's essay on 'Radical Empiricism and Religion' criticizes the individualistic presuppositions of James's *Varieties of Religious Experience* and points out that "religion is an institutionalised form of behaviour rather than a kind of experience" (p. 345), which is no doubt true, if somewhat trite. But it should also be obvious that if you are trying to persuade anyone to give religion a trial, it is no use telling him what a great and powerful social institution it is; that is an argument for conformity, not for belief. Prof. Schneider also declares that "at present almost all the great religions are decadent" (p. 347), and has some hard things to say of theology which "is not primarily a science, but a religious technique" (*ibid.*), and does harm chiefly "neither to science nor to society, but to religion. It robs religion of its spontaneity and humaneness" (p. 351). Prof. T. V. Smith, of Chicago, writes a lively essay on 'the Rôle of the Philosopher', in which he declares

that " metaphysics has never been a discovery of something back of physics, but the unacknowledged invention of balm for the wounds of physics " (p. 364), and that " it is a sure mark of apostasy through pride when a philosopher begins to glory in a technical terminology " (p. 360). I agree that technicality and jargon are deadly to philosophy but would suggest that their motive is more frequently protective. They are prompted by the fear of being found out! Dr. John Storck writes an interesting logical paper under the title ' A Methodology of Thought ', from which I would select: " in the strict sense logics never prove; they exhibit compatibility. In this sense they are precisely like works of art " (p. 379). The plea of Mrs. Tufts's well-written ' Looking to Philosophy ' is that amid the complexity and confusion of modern times there is great need for a usable philosophy. And Prof. Woodbridge finishes up the series with ' Some Implications of Locke's Procedure,' in which he declares that " Locke is primarily a moralist and not a logician". On the whole the text is commendably free from misprints, though on p. 70 Prof. Burtt has allowed the printer deliciously to turn ' verification ' into ' versification '!

F. C. S. SCHILLER.

The Function of Reason. By A. N. WHITEHEAD, Sc.D., LL.D., F.R.S. London: Humphrey Milford, 1929. Pp. iv + 72. 7s.

ONE hears so many complaints nowadays of the obscurity of Prof. Whitehead that it is a pleasure to recommend a book from his pen which is very clearly written and which ought to confuse no one. The style as usual is crisp and terse, while the thought, though extremely speculative, remains throughout admirably sane. No doubt, if the reader tries to work out fully the suggestions and implications of these seventy-two pages he is bound to meet with baffling difficulties, but there is little in the book itself to baffle him. It consists of three lectures delivered at Princeton University in the Spring of 1929. The key to the understanding of the lectures is given in an introductory summary. Two empirically revealed tendencies are at work in the universe, the one the counter-tendency of the other. On the one hand, we observe the slow descent of physical nature, ' towards nothingness ' (p. 28); on the other, a regenerative and originative force working upwards. The task Prof. Whitehead sets himself is to determine the function of Reason in the face of these cosmic tendencies. He concludes that Reason is itself the originative element, though not in all its forms, but only as it is self-constrained and self-disciplined. " Reason is the self-discipline of the originative element in history ".

In the first lecture Prof. Whitehead expands this theme. As a rough definition with which to begin he offers the following: 'the function of Reason is to promote the art of life'. It is always suggesting and making possible a better life. As such, Reason may be viewed from two aspects. It is the divine element in the highest life of man; but it is also the prudence and ready wit, the shrewdness and even craftiness which has helped man to attain his present level of growth and evolution. Now Reason of this second kind is not confined to the human race. It pervades the animal and even the physical world, so that apart from it no complete and ultimate explanation of these worlds can be possible. Final causes, presupposing Reason, must be taken into account not only when dealing with human beings but throughout. Purpose is pervasive. Whitehead is aware that this doctrine is hardly likely to be approved by orthodox physiologists. So much the worse, he thinks, for the physiologists! The defect of modern science is its tendency towards dogmatism. It has a right to its own method. But it has no right to hold that its method is the sole method, and it has no right to set down for us dogmatically and finally the ultimate categories of all explanation. The scientist has a right, for methodological purposes, to ignore all final causes in a particular realm. But he has no right to deny their existence in that realm. The dogmatism of such a denial is really a sign of a tragic absence of Reason, for it is Reason which frees us from dogmatism and from bondage to established methods. The scientist who sets out to deny final causes altogether is in an impossible position—"Scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study" (p. 12)—whilst to insist on dismissing final causes even in the animal and physical realms is to proceed in what is really an irrational manner. Consequently, if we wish to understand Reason from all its aspects we must not disregard its cosmic character as the source of final causes. From one point of view the task of Reason is simply "to constitute, emphasise and criticise final causes and strength of aims directed towards them" (p. 21), and this not only in human life, but in all life and in all being. The desire for increased life is appetition; but such appetition finds a discipline in Reason. "Reason civilises the brute force of anarchic appetition" (p. 28).

The second lecture is devoted to the consideration of the relation between Reason in the above rather pragmatic sense and Reason in the other sense, *qua* speculative. We find in us an urge to attain full knowledge, not so much as a means to anything else but rather because knowledge itself is intrinsically good. Reason, in the first sense, now termed by Whitehead 'practical' Reason, is old, older than man. It is certainly a characteristic of all organic life. Speculative Reason, on the other hand, is young. It belongs to the last six thousand years or so and became particularly important when the Greeks learnt to introduce method and order into

speculation. (Prof. Whitehead in his enthusiasm for the achievements of the Greek peoples makes a statement which seems rather to contradict the spirit of the first lecture. "The Greeks," he says, "produced the final instrument for the discipline of speculation" (p. 32). Are we to take this to mean that Greek logic is the final truth about logic and can never be bettered? This would surely be an instance of the very dogmatism Whitehead would have us avoid.) On the general question of the inter-relation of practical and speculative reason we see that the greatest advances have been made when the two co-operate. The remarkable technical advances of the last century and a half have been due entirely to the fact that practical and speculative reason have made contact to the great advantage of both. Our control over nature follows upon a knowledge of it, but this knowledge is not gained without much thought, much making of hypotheses and much speculation. Again, it is never complete and final. Instead of a dogmatic finality all we actually find is "an asymptotic approach to the truth" (p. 43). Yet not even this approach would be possible apart from speculative inquiry. There can, therefore, be no divorce between speculative and practical reason, or again between philosophy and science. The hope of mankind lies in their continued co-operation.

In the final lecture the true character of speculative Reason is elucidated. "Its function is to pierce into the general reasons beyond limited reasons, to understand all methods as co-ordinated in a nature of things only to be grasped by transcending all method" (p. 51). It looks beyond the present to the ultimate and infinite, and it does not confine itself as practical reason does. From its vantage point it sees new possibilities and it criticises them beforehand. Now, perhaps, the greatest advance ever made by man was made by the Greeks when they discovered that speculative Reason not only disciplined the practical but could itself be subjected to discipline. In this way it was rid of the anarchic character that pertains to mere inspiration. Whitehead here enunciates five criteria which together form the logical test for all beliefs suggested by speculative Reason. The content of a belief should (*a*) conform to intuitive experience, (*b*) be clear, (*c*) be inwardly consistent, (*d*) be outwardly consistent, (*e*) fit into a well-tested logical scheme of things. Prof. Whitehead stresses the fact that the application of all these criteria is difficult, yet they all help to discipline reasoning. Particularly helpful, he thinks, is the existence of a schema. "The secret of progress is the speculative interest in abstract schemes of morphology" (p. 58), and he considers scheme-production to be "a major effort of the speculative Reason" (p. 56). Disciplined in this manner, speculative Reason may work through the channels of a particular science or again attempt a cosmology interpretative of all sciences. In both cases we are not to expect immediate results: knowledge lies in 'a gradual approach to ideas of clarity' (p. 71). But the force in the world which makes for life and ac-

tivity, which strives against the dead hand of physical deterioration, that appetition which is the non-physical tendency present in life, gains sight and understanding in Reason's gradual clarification of its own ideas. "Mere blind appetition would be the product of chance and could lead nowhere. There is a discrimination of appetitions according to the rule of fitness. This reign of Reason is vacillating, vague and dim. But it is there" (p. 72). Such is the conclusion of the work.

We have been compelled to omit all the minuter details of Prof. Whitehead's argument. Yet it is in reflecting over the details that one best realises the fruitfulness and originality of the writer's mind. An excellent instance is the suggestion thrown out on p. 17 as to the true character of music, a suggestion we should like to see Prof. Whitehead develop. But it is in details also that we found the greatest difficulties. Thus we doubt very much whether his attempt on pp. 25-26 to distinguish between mind and body, and mental and bodily experience (Is there really such a thing as 'sheer physical experience'?) is successful. We should also question the description of the lowest form of mental experience as 'a blind urge towards a form of experience' (p. 26). Can any urge towards an end be rightly described as blind? Further, the word 'experience' is used ambiguously in the last lecture. We felt that the conception needed fuller and more precise analysis than Prof. Whitehead gives us. What, for instance, is the relation between his 'Intuitive experience' and the penetrating Reason he talks of on pp. 36 and 51? Again, what are we to mean by 'categoreal notions' which rest on 'broad, widespread testimony' (p. 62)? Would Whitehead deny the necessity usually attributed to the so-called *a priori* principles? Or is this a misinterpretation of his position? Extremely difficult problems such as the above arise when one tries to work out the full significance of Prof. Whitehead's theories.

There are other points of detail we might discuss; but it is better to consider the general thesis. The argument is based on a rather speculative hypothesis that the whole physical universe (not merely the solar system) is gradually descending to nothingness. Like a clock it is running down. It would be interesting to consider the changes that would become necessary in Whitehead's account of Reason if this hypothesis were rejected. If the hypothesis stands, however, Prof. Whitehead's interpretation leaves us with a dualism, and it is obviously his next task to attempt to overcome it, to find one explanation both of the decay of the physical world and of the upward tendency in life. Indeed the final relation between the two tendencies is not clear. Does he mean to suggest that the 'upward tendency' will always succeed in checking the 'downward,' or, again, if it does not, will it itself cease to be with the ceasing-to-be of physical nature? Or are we to think of some new order which will continue when physical nature has ceased to exist? The final words of the book seem to suggest the latter alternative. "We

have some knowledge of that counter-tendency which converts the decay of one order into the birth of its successor" (p. 72).

There are two further points at which we hesitate. It is not clear by what standard of evaluation Prof. Whitehead judges the second tendency to be 'upward', especially if it is borne in mind that we are not speaking in terms of human beings but rather in terms of the whole universe of being. Prof. Whitehead might reply that there is no ultimate difference here, for Reason in man is but the embodiment of a like function in the universe, and it is this which sets the standard. But this brings us to the second point. The term Reason, we feel, is used by Prof. Whitehead in a very wide and even loose manner. His use of it seems to include, at least, imagining, conceiving, forming of hypotheses, reasoning, memorising, controlling, willing and knowing. The result is that from a psychological point of view the book is rather unsatisfactory. And the question arises: Can we ever realise satisfactorily Reason's part in the cosmos, without first making clear Reason's part in the human mind and in human experience? Perhaps, the criticism is of no great importance; at any rate, it arises from a personal impression which may not be shared by others. But we were constantly worried in our effort to follow Whitehead's identification of Reason within us with something like Reason without, by this vagueness as to the meaning of our term. None the less, we think these lectures excellent philosophising, and very worthy of respectful attention. *The Function of Reason* is surely the best of Prof. Whitehead's shorter works.

R. I. AARON.

Les Mythes de Platon. By PERCEVAL FRUTIGER. Paris: Alcan, 1930. Pp. 295. 35 fr.

MR. FRUTIGER'S balanced, learned, and admirably written study should be very welcome to Platonic students in our own country, where, I believe, there has been no monograph of importance on the subject since J. A. Stewart's *Myths of Plato*, a work to which Mr. Frutiger refers on pages 220-221 with a touch of acerbity unusual in him. (Perhaps he has not the special interest some of us feel in the obscure links which connect Plato with Dante and Bunyan; one who, like myself, shares that interest is a little pained to find Professor Stewart's curious lore described as *le fatras dont il a encombré son livre.*) Mr. Frutiger's own study falls into three parts, dealing severally with the relation of myth to dialectic in Plato, the philosophic interpretation of the myths, and the myth as a literary type in the fourth century B.C. The first division again is introduced by some excellent chapters which form an admirable destructive

criticism of a whole series of antecedent *a priori* theories of what the Platonic myth must be. Mr. Frutiger seems to have made the whole of the fairly extensive literature of the subject in French and German his own, and it may fairly be hoped that his trenchant criticism will give the *coup de grâce* to the reckless dogmatism of writers like Teichmüller and Couturat. (The Couturat of the early dissertation *de Platonicis mythis* was not yet the careful and fully equipped scholar of the subsequent works on Leibniz.)

Starting, as he rightly does, from the rational principle that there is no *a priori* method of determining what Plato must have meant by μῦθος, and that any understanding of the purpose for which he employs μῦθοι has to be gained by an inductive examination of the passages in his works indicated by himself as μῦθοι, Mr. Frutiger has no difficulty in disposing of such extravagances as Couturat's theory that a Platonic myth is always the embodiment of some thesis regarded by the philosopher as simply false, but desirable to propagate for edificatory purposes. As he rightly argues, the conception of Couturat—it is incidentally adopted at times by Dr. A. W. Benn among others—is not only inconsistent with everything the dialogues disclose to us of Plato's personal character, but when carried to its logical consequence, would reduce the whole of the Platonic philosophy to little more than the single thesis of the reality of the εἴδη. This should be a sufficient *reductio ad absurdum*, since it involves, among other things, treating the whole doctrine of the "tripartite soul," for which Plato has been careful to produce elaborate rational grounds as well as confirmatory empirical evidence, as mere edifying fiction. But if it were no more than that, it is unintelligible why Plato should have troubled to argue the point as he has done in *Rep.* IV., instead of being content to make a simple authoritative statement.

The same considerations apply to the doctrine of the soul's immortality, which has also been asserted by Couturat and others to be another *pia fraus* with no purpose other than that of assisting the magistrate to enforce a moral standard. Mr. Frutiger's careful and thorough proof of the seriousness of Plato's belief in immortality ought really to be final where it is needed, and I am happy to think it is not among Platonic students in Great Britain.

It is perhaps all to the good that the author's own statement about the nature of a Platonic myth, when it comes, is not unduly rigid and precise. The "myth" in Plato is characterised simply by a contrast not with truth, but with "dialectic." That is, its distinctive character is not that it is false—on the contrary, it is often the vehicle for expressing what Plato regards as supremely important truth—but that what it asserts cannot be completely demonstrated. (This is why assertions about the structure and destiny of the ψυχή have to be largely conveyed in myth; they are true, or as near the truth as Plato can make them, but he is aware that his positions, however true, are not capable of complete

demonstration, and is conscientiously anxious to mark the point. Of course what one age cannot demonstrate may be successfully demonstrated by the resources of a better equipped age, and what a given thinker cannot demonstrate at one stage of his career, he may believe himself able to demonstrate at a later stage. In fact, Mr. Frutiger holds, this was actually the case with Plato himself. When he wrote the *Meno* he believed in ἀνάμνησις and immortality, but believed in them as "matter of faith," and therefore presented his beliefs simply as myth; when he came to write the *Phaedo* he believed that he could demonstrate both as consequences of the principle of the reality of the εἴδη; the doctrines have thus passed over, in the *Phaedo*, to the sphere of dialectic. It follows then that the distinction between myth and dialectic is a relative one, and must not be drawn in too hard and fast a manner (p. 144); and again the fact that the destiny of the soul has so often been made by Plato the subject of myth affords no excuse for the attempt to treat the strictly rationalistic theological demonstrations of *Laws* X. as "myth."

It will be seen that Mr. Frutiger's treatment of the problem has much in common with that suggested in several places by Burnet, who is more than once quoted with approval. I think that had the author known Prof. C. C. J. Webb's description of the Platonic myth as a "surrogate" for history where a strictly historical narrative is unobtainable, he would have welcomed it as expressing happily a great deal of his own view. Probably, however, he would not altogether agree with Burnet and Webb, if they mean their language to apply to Platonic myth as a whole. For he argues against Deuschle's view that the myth is for Plato the proper vehicle for dealing with "becoming" which cannot be the object of science proper (p. 173), that Plato's myths are not all exclusively concerned with genesis and origins. The *Timaeus* is throughout a prolonged myth, but if we accept the traditional Academic exegesis, as Mr. Frutiger agrees with most students that we must, the real object of the myth is not to speculate on the way in which nature has come to be, but to analyse its structure.

I think there is more to be said here for Deuschle than Mr. Frutiger admits. It is true, I grant, that the *Timaeus* does not really mean to tell us how nature began to be, but how it is now organised, and that Plato held that souls have never begun to be; but it is equally true that, even though there may never have been a beginning of nature, or of my ψυχή, the life of both, unlike the being of the εἶδη, is one perpetual *devenir:* both are immersed in temporality. And this does seem to me to be the reason why truths about them cannot be demonstrated.

Naturally there are many incidental positions adopted in the course of the discussion to which we might not all be able to accede without further argument. In one respect I think there is an element of "myth" in Mr. Frutiger's own interpretations. I believe he

tends too readily to assume, like the earlier writers on whom he relies for his order of the Platonic dialogues, that if a thing is said in dialogue *B* which is absent from *A*, Plato must have discovered it for the first time after writing *A*. (E.g. the absence of all production of rational grounds for the doctrines of ἀνάμνησις and immortality from the *Meno* is regarded as proof that at the time of composition Plato had thought of none. He must have experienced a great illumination after writing the *Meno* and before writing the *Phaedo*.) But is it a fact of our experience that a writer who expresses a conviction without producing grounds for it is always unaware of grounds which he could allege if he thought fit? (Need the facts about the *Meno* prove more than that Plato did not think it *à propos* to insert the substance of the *Phaedo* into a discourse of Socrates with a spoilt Thessalian young man?) And again, I am not sure how far it is safe to make confident inferences from the details of the dialogues about the historical development of Plato's personal thought. Mr. Frutiger develops an argument of this kind about Plato's psychology at some length. From the silence of the *Phaedo* about the "parts of the soul," and its emphasis on the unity of personality, he infers that the tripartite psychology is a personal discovery of Plato made after the *Phaedo* and before the *Republic*, the "simple soul" of the *Phaedo* being that which he had learned from Socrates to believe in. The *Republic* and *Phaedrus* represent a second stage, in which Plato believes in the "three parts," and holds that all three persist after the dissolution of the body. In the *Timaeus* we get yet a third stage of development, according to which only the λογιστικόν persists after death. Now I do not say that this may not possibly be a correct interpretation of the evidence, but I see no means of proving that it is so. Apart from the questions whether the testimony of Posidonius to the Pythagorean origin of the doctrine of the tripartite soul can be simply dismissed—and I think Mr. Frutiger is too prone to follow the sceptical lead of E. Frank in these subjects without sufficient examination—whether the doctrine is not really implied in the theory of the "three lives," which is certainly to be found in the *Phædo*, and whether the teaching of the *Timaeus* itself is quite correctly reproduced when it is made to assert that the "lower parts" of the soul are "radically bad," I feel grave doubt whether the kind of discrepancy on which Mr. Frutiger relies is not due rather to the presence of incompletely co-ordinated factors in a theory which remains substantially the same than to conscious replacement of one theory by another in different dialogues. Mr. Frutiger himself is quite alive to the fact that it is not given to philosophers to be free from contradiction. Spinoza, whom he mentions, is an excellent case in point. It is clear that the concluding section of the *Ethics* implies a conception of God inconsistent with all that has gone before; and equally certain that this is no case of an "earlier" and "later" Spinozistic doctrine: If this could happen with Spinoza, I do not see why it might not

equally well happen with Plato, especially on such a secondary point as the precise character of a disembodied soul. I might even, perhaps, make Mr. Frutiger himself an example in point. He is anxious to identify the "demiurge" of the *Timaeus* with the νοητὸς κόσμος of the εἴδη which he is said to take for his model; so anxious, in fact, that he defends the perplexing ἀιδίων θεῶν γεγονὸς ἄγαλμα of 37 *c.* 6 as a sound reading. Yet he also says (p. 244) that the demiurge is manifestly the world-ordering νοῦς of Anaxagoras. There seems to me to be here a more real contradiction than any to be found between the *Phaedrus* and the *Timaeus*, but I feel confident that the explanation is not to be sought in an "evolution" of the writer's thought.

There are other incidental positions which seem to me to call for some defence before they can be accepted as established. I feel, for example, that if weight is to be attached to the view that the whole doctrine of εἴδη is a discovery of Plato's made after the death of Socrates, Burnet's reasons for holding the opposite view ought not simply to be set aside without consideration. Again, when an acute and successful proof that the account of the "first" and "second" cities, or of the series of defective constitutions, in the *Republic* is not meant for an historical speculation is followed by the inference that in *Laws* III. also Plato has no historical purpose, we may be dealing with a mistaken inference. Surely the remarks about the history of Persia and of Athens since the age of Cyrus are meant to answer a question about history, and if so, the same may be true about the preceding pages which profess to sketch the history of the formation of Hellenic monarchies, the Trojan War, its consequences, and the "Dorian Conquest" of the Peloponnese. The presence of such an interest *may* be one of the points of difference between the *Laws* and the *Republic*.

Doubts about such matters do not, of course, affect one's judgment of the high value of Mr. Frutiger's discussion of the problems raised by the presence of the mythical element in the dialogues. Personally, I have to thank the author for his generous avowal of anticipation on a small but interesting point (p. 285), and to confess in return that I fear he has fairly caught me in an oversight about the *Phaedrus* in his note 2 to page 255.

A. E. TAYLOR.

The Problem of Substance. University of California Publications in Philosophy, vol. ix. Edited by G. P. ADAMS, J. LOEWENBERG, and S. C. PEPPER. California: Univ. of California Press, 1927. Pp. 198. Price $2.50.

I OFFER my apologies to readers of MIND and to the authors of the book for the belated appearance of this notice, a lapse for which I alone am regretfully responsible. The "Problem of Substance"

under discussion, is, briefly, its existence and knowability. The conclusions reached by the seven symposiasts (waiving for the moment all modifications they impose) are: the existence of substance (in a certain sense only) and the knowability of its nature, are maintained by Profs. Dennes and Muirhead, denied by Prof. Pepper and Mr. Murphy, affirmed problematic by Prof. Prall; its existence, but not its nature, is allowed knowable by Profs. Loewenberg and Lenzen.

Prof. J. Loewenberg, at the opening of his paper "Subject and Substance," distinguishes three main senses in which each of these terms are used—a 'logical,' 'epistemological' and 'metaphysical'. [For convenience I shall refer to these six meanings as A1, A2, A3; B1, B2, B3, respectively.] His central questions may now be expressed—(i) How is each pair of these correlate terms connected? (ii) What reason have we to accept B3 as genuine? (*i.e.*, "substance" as the absolute, self-existent, underlying reality known only through manifestations which can neither define nor exhaust it: *cp.*, Spinoza, Santayana). In answer to (i), B1 is distinct from A1 in being restricted to existential continuants. A2 and B2 are "coequal and co-ordinate," neither is "capable of suppressing or replacing the other," but A3 and B3 cannot remain co-ordinate, their opposition is extreme—"one must somehow swallow the other"—and this sooner or later involves affirming or denying the primacy of mind. In answer to (ii), B3 is prior to A3 as to everything else, and this realism recognises in holding that mind is derivative, that "it is a manifestation of something else, and not everything else a manifestation of mind." The principle that reality is independent of its being known is then a simple corollary from a belief in substance. The realism of science likewise presupposes something prior to relations and their relata, and this presupposition is identified with B3, though later, the 'substance' of science, it is said, may all the same be "accidents of a deeper reality".—I think it a serious defect in this analysis that it recognises only one sense of 'metaphysical' substance (B3—the absolute, Spinozistic one). If by 'metaphysical' is meant 'ontologically ultimate,' it will follow that other senses of substance, equally "metaphysical" (*cp.*, Aristotle, Thomas, Leibniz), ought to fall under B3, whereas, presumably (on analogy with the fate of McTaggart's 'substance') they would be relegated to B1—that of a *logical category*. B1 is not, however, defined as being 'ontologically ultimate.' So too, within this symposium there are further cases in point: it is only in the unfortunately restricted sense (B3), so far as I can see, that we should say that Mr. Murphy denies and Prof. Prall considers only problematic, the existence of "substance". It is not until Prof. Dennes' paper is reached that this undue restriction of the term 'metaphysical substance' is virtually disallowed.

Prof. D. W. Prall's paper, "The Logical Substantive," begins by showing the necessity of an ultimate category of 'substantive

proper' (B1), for logic. Though demonstrative inference depends entirely on connexions that are adjectival or internal (thus, on the characteristics of substantives and not on their "substantiveness"), unless the otherness of substantives was presupposed in inference, nothing could be meant by calling relations 'internal'. Thus all demonstrative inference, though it does not apply to substantives (but only to adjectives), yet presupposes them. And problematic induction, proceeding from instances that are different, clearly presupposes substantives too. But we may not infer from such presupposition that 'metaphysical substance' (B3) exists, much less that we can have a literal and accurate knowledge of its nature. For the referential function of the substantive is simply a "pointing," though, true enough, it is a pointing to "instances". We can never be rationally certain that that which is pointed to, and that which discourse attempts to be about, really is as discourse describes it. The necessity of the substantive function permits us to infer, not the nature of substance, but "the cognitive limitations of those specific modifications of substance that are human beings". The existence of substance is neither demonstrable nor rationally warranted, but originates in "natural instinctive trust".

Mr. A. S. Murphy's discussion, "Substance and Substantive," concludes with a denial of substance (B3) on the ground that "relativity" is "ultimate and objective". The "ultimacy" of B3 is interpreted to mean "independence of relations". There neither is, nor can be, any existent which determines its characters but is itself determined by no characters. So he explains the conception as "the product of an arbitrary desire" (*viz.*, "to treat as absolute some aspect of reality that is inherently and inescapably relative"). Whitehead alone is said to have recognised that there is no "special and self-contained" nature which events as such ('substantives' for Mr. Murphy) possess, besides the bare fact of occurrence and transition. "What occurs is always extrinsic and never derivable from the bare event as such." So, the writer concludes, "the search for the absolute is not an attempt to supply something this relative world lacks, but to suppress that which it essentially contains, the fact of interaction".

"The Fiction of Attribution" of Prof. S. C. Pepper denies that the opposition of substance and attribute corresponds to "any division inherent in reality". This he tries to prove by assuming straightaway that 'substance' and 'attribute' "represent an opposition *of status*". From this it follows that two types of ontological theory are possible, *viz.*, "Preferentialism" (which "assigns a certain set of favoured characters to the field") and "Particularism" (which denies all characters to the field—"a spread of bare particulars" which assumes form only as characters come into it). Prof. Pepper's objection to pure 'particularist' theories is their inability to account for structure, either as appearance or reality. Neither 'pure' existent particulars, nor 'pure' subsistent char-

acters exhibit structure of themselves. And since participations of the former in the latter cannot do so, the structure of concrete existents remains unexplained. In " preferentialist " theories, on the other hand, the existential field is structuralized by a set of primary characters, one of which can " qualitatively individualise " parts of the field into " integrated patterns " according to some law. Correlated with certain clusters of primaries are certain secondary characters that do not intrinsically qualify the field. The objection to this type of theory is its inability to account for *similarity* of qualities. Thus, ' particularist ' theories, allowed similarity among subsistents, cannot explain structure in the world, while ' preferentialist ' theories, allowed structure (principle of correlation), cannot account for similarity in the world. From which Prof. Pepper concludes : " The whole enterprise of developing a metaphysical theory out of the logical convention of substance and attribute is thus impossible ".

Prof. W. R. Dennes seeks, in his contribution " Primary Substance," to rehabilitate a view, in the main Aristotelian, not so much by constructive argument, as by defending it against common objections, and more particularly those advanced by his colleagues in the preceding papers. As against Aristotle, Descartes, and Prof. Loewenberg he argues that there is no rational objection to regarding qualities " as simply the qualities they are " without supposing them necessarily attributes of something else. Substance, however, cannot be replaced by " textures " or unities of qualities—there is an indubitable, factual difference between a complex of qualities as a merely unified complex, and as the character of an occurring and existing individual. To the hypothesis that substance is simply a category or concept, Dr. Dennes admits that a predicate (*e.g.*, ' substantial ') does not imply ' existence,' but holds that this predicate would never really be applicable unless it were a fact, not that we infer, but that we *experience* individual occurrents that require this predicate for their characterisation. As to the relation between B2 and B3, Dr. Dennes denies that individuals cannot be self-existent and substantial because they are determined by qualities and relations—neither character nor occurrence is substantial, but a characterised occurrent is. The last section, following Aristotle's lead, defends substantial pluralism very effectively, and concludes that, in the end, " no explanation can make either a grain of salt or the universe *quite* intelligible. There is an impenetrable core which is irrational," but " this core is not substance, nor self-existent matter, nor body, but is the material cause which is (and which shows itself) only in the fact of the individual occurrence of each existing thing ".

Prof. V. F. Lenzen's article, " Physical Substance " is extremely good and clear. He starts by analysing the presuppositions of measurement, since the pervasive characters of measurable reality will give the connotation of ' substance ' as employed in physics.

These characters he decides are three: constancy, objectivity, and extensiveness. The distinction between 'substance' and 'measure,' introducing a further one, between "substantial definition" and "dimensional formula," proves that the concept of substance is essential to physics. Next, grounds are sought to show that 'physical substance' has valid application to the world sensibly experienced. The defining attributes cannot be experimentally verified, nor all of them experientially attested, so it follows that 'physical substance' is not derived from experience but is an ideal construction. Even so, there must be some property experientially given to furnish a base for its construction. This is extension; none of the other properties, inertia, mass, electric and magnetic properties, are experiential data. Relations between the measures of such properties, however, as expressed in laws, are approximately applicable to the physical world. So arises the question: How is it possible to measure empirically properties that are not empirically given—even though earlier analysis has shown that measurement does not presuppose knowledge of the intrinsic nature of what is measured? Ultimately for physics, the measures of any property are determined by measures of extension. Physics then is a rational system consisting of undefined concepts and postulates, defined concepts and theorems, and the *logical* analysis of physical substance (of which physics expresses systematically the nature) is that of determining the function of various concepts of substantial attributes in the system. This is a distinct problem from the previous, epistemological, one—epistemological priority is irrelevant to it, since consideration of the experiential basis of a concept do not determine whether it is to be taken as defined or undefined in the system. Much here clearly turns on the nature of definition, and Prof. Lenzen draws useful distinctions between "structural," "functional" and "dimensional" definitions, and again, between "functional definitions" and "functional propositions," as a result of which he is able to define a system of physics as a logical structure of functional definitions and functional propositions. Different alternative systems are logically possible, the "functional propositions" of one being transformable into "functional definitions" in another. And of physical substance he decides that we know that it is, how much it is, relations between its measures, but, excepting the property of extension, its intrinsic nature is problematic and that of specific substantial attributes appears radically insoluble —"the method of measurement leaves an insoluble residue as a basis for scepticism in metaphysics."

In the last paper, "Self and Substance," Prof. J. H. Muirhead argues for a plurality of substances which form a hierarchy according to complexity in individuality, and this he takes as implying that substantiality is susceptible of degrees. Accordingly, he draws a distinction between "formal substance" (that substantiality of a thing due to its being a concrete unity of differences) and "essential

substantiality" (the degree in which it reflects the character of the whole). This view rules out once for all any "merely pluralistic" or "merely monistic" interpretation of the world. Applying this distinction to the Self, we have (i) corresponding to "formal substantiality," particular activities "pervaded by some unity of principle both in their simultaneous and in their successive exercise"; (ii) a certain degree, as compared with other substances, of the inclusiveness called "essential substantiality". Setting this in relation with pluralistic and monistic theories, Prof. Muirhead agrees with the former that the self is, or may become, a substance, in both formal and essential senses, but does not agree that it is independent, self-subsistent or self-contained. He agrees with monism that the self is a finite and particular embodiment of something that transcends it, but does not agree that it is adjectival, holding, on the contrary, that it is "self-substantializing" so far as it is self-unifying.

S. V. KEELING.

VI.—NEW BOOKS.

The Psychological Approach to Reality. By FRANCIS AVELING. London: University of London Press, 1929. Pp. ix, 251. 10s. 6d. net.

THE title of this book is significant. We are not at Reality but have to get there. We start by knowing nothing but our own mental states and have by some magic to get beyond them to a 'transcendental reality'. Dr. Aveling has a potent spell for his necromancy—the third of Prof. Spearman's 'noegenetic principles'—and so great is his faith in this that he does not allow himself to be dismayed by the failures of his distinguished predecessors to accomplish the same task; indeed, he does not even mention them.

The problem as he sees it is to give an account of the nature and validity of knowledge, starting from the standpoint of Solipsism. Why start from Solipsism? Since "the act of knowing is a mental—indeed, an entirely personal and incommunicable—process" (p. 4), the same must be true of what is known, whatever its nature. "To describe a tree growing in the garden, or a watch lying on the table, is as much to describe a mental object as to describe a feeling or a willing or a mental image is; for in all these cases it is something known (*i.e.* forming part of knowledge, which is mental) that is described" (p. 20). The term 'knowledge' is here used to cover both 'knowing' and 'known,' and the reader who admits that 'knowing' is a function of mind is lured into the admission that what is known must be equally mental. (It should be noted in passing that in describing and rejecting the popular conception of the distinction between subject and object, the die is weighted by identifying the distinction with that between the mental and the non-mental; thus a willing and a mental image are classed together as equally subjective.) But if to be known is to be mental and to fall within the private existence of the individual self, then Dr. Aveling's question answers itself by the very terms in which it is stated—it is absolutely impossible for the individual to know anything beyond himself and his own states. But closer examination reveals a distinction which, though introduced incidentally, is the key to his whole procedure. It is that between 'mere lived experience' and 'cognised or known experience' and is mentioned, as if it were a matter of course, when he is maintaining (p. 20) that the objects known both in introspection, *e.g.* of a feeling, and in inspection, *e.g.* of a tree, are equally mental. The real point of his argument seems to be that in both cases what is known is only what is immediately experienced, and that what is immediately experienced must fall within the private existence of the experiencing individual. That this is really his position is clear from the whole tenor of his work. He starts from Prof. Spearman's first two 'noegenetic principles'. (1) "Any lived experience tends to evoke immediately a knowing of its characters and experiencer". (2) "The mentally presenting of any two or more characters (simple or complex) tends to evoke immediately

a knowing of relation between them" (p. 62 n.). These principles, he assumes, express not only a true but a complete account of at least the primary objects of knowledge. The initial assumption is, therefore, solipsism. Is there any escape from it? Most of the book is occupied in showing that there is none until we take express account of the knowledge which the experiencer has of himself as distinct from his experiences. The most primitive objects consist in what Dr. Aveling rather oddly calls "empirical experience", *i.e.* sensations and percepts—Berkeley's immediately perceived ideas. This supplies a material from which other objects are reached by various mental operations. Among these he lays chief stress on 'Correlate Eduction' as defined in Spearman's third noegenetic principle—"The presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character" (p. 63 n.). (Dr. Aveling seems to regard this as an original discovery of Spearman's, and as a satisfactory solution of the epistemological problem, rather than a description of what sometimes happens, which raises in a special form an urgent problem for the philosopher.) But neither correlate eduction nor any other mental process can do more than rearrange and transform the given material. Hence the objects which arise in this way are still only part of the private experience of the individual, "personal and incommunicable". Dr. Aveling attempts to show this in detail for ideal principles, such as the law of contradiction, and for space, time and causality.

His treatment of causality is specially important for the general argument of the book. He holds, as many others have held, that in our own voluntary action we have a lived experience of causal efficiency. But he gives a special analysis which he claims to be placed beyond reasonable doubt by experimental evidence. He distinguishes desire and intention on the one hand from conation (or striving) and its resulting action on the other. I desire and intend to move my leg. So far there is no experience of causal efficiency. "The relation of cause and effect is lived" only "when I, wishing to move my leg, strive; and my leg moves" (p. 144). Here there are two distinct relations, one between intention and striving, the other between striving and its sequel. Does Dr. Aveling regard both these relations as immediate experiences of causal efficiency, or only one of them? And if only one, which of them? He does not seem at all clear on this point; yet it is important. If "intention" is taken to be a separate event radically distinct in its nature from "striving," then what existential relation can be experienced between them except that of temporal sequence? If there is an experience of cause it must consist in the felt continuity between intention and striving, the intention being continued into the striving in a way which presupposes that the intention is already a nascent striving. In that case Dr. Aveling's sharp distinction between them is lost. If on the other hand we consider the relation between striving and its sequel, even though we may grant that there is here a causal experience, we must recognise that it does not include or involve invariable or necessary connexion. Speaking literally, we do not always hit the nail on the head, however hard we may strive to do so. Striving fails or succeeds in very various ways and degrees according to circumstances. This point is important because of its relevance to the question how the general notion of cause and effect and the general principle of causality are reached from the experience of causality involved in willing. Dr. Aveling finds the key to his problem in 'correlate eduction'. In other words, there is an analogical transference of what we are acquainted with in our ordinary actions

to other items of experience. But if the transference is to be successfully made there must be some ground and justification for it. This Dr. Aveling finds in certain characteristics common to other relations and to "the causal relation as we immediately apprehend it in ourselves. Those characteristics are necessity, invariability, immediacy, and the like" (p. 148). But there is no invariable connexion between striving and its sequel. This is no doubt why he here dwells rather on the relation of intention to striving. But is striving always preceded by a voluntary decision? And when a falling stone makes a splash in a lake do I ascribe to it anything analogous to the intention of making a splash? There are still more serious difficulties. How can we without *presupposing* the causal relation discover necessity and invariability in the sequence of events? This was the crucial question raised by Hume and Leibniz; Dr. Aveling has given no answer to it, nor apparently has he realised that there is a question.

The causal experience being, like other experiences, private to the individual, the knowing of it does not of itself take us beyond solipsism. For this we must take it in combination with the unique knowledge which the thinking and experiencing subject has of itself. It knows itself, according to Dr. Aveling, as "a fundamentally simple or incomplex existent" (p. 195). "It is immediately experienced only as it actually energises" (p. 197), *i.e.* as knowing, willing, etc.; but since, as Dr. Aveling points out, "these activities cannot be reduced one to the other" (p. 196), he must take it to be distinct from them, if it is one and the same simple and incomplex self which is experienced in each of its activities. Our knowledge of it is evidently a direct intuition of it as it is in itself—"a knowledge of acquaintance with Self as object, not a knowledge about it". "The Self as immediately known in experience is directly apprehended as a 'that', not as a 'what'" (p. 196). But if this simple subject is "something immediately lived and immediately known in experience" (p. 195), what becomes of the general principle with which he started as evident, that in knowing our own experience we can know nothing beyond it? If this is not true, the whole of his previous argument is undermined. Dr. Aveling simply asserts that there is an intuition of the kind he describes. He does nothing to meet the difficulties raised, *e.g.* by Kant in the Paralogisms of Pure Reason.

"It is this psychologically absolute and subsistent real, immanent and transcendental, that allows us to franchise the boundaries of solipsism. . . . The real Self is the epistemological $\pi o\hat{v}\ \sigma\tau\hat{\omega}$ for all Reality" (p. 210). The transition is effected through the "immediate awareness of the Self as causal" (p. 215). But not directly; for why should the self be causal in relation to anything but its own experiences? Dr. Aveling has therefore to fall back on the contrasted and correlated awareness of the self as passive, *e.g.* in sensation. Such passivity implies correlative agents. The agents which affect the self cannot be its own experiences, for these experiences are themselves its passive affections. Hence they must be extra-mental realities. It is admitted that we cannot know what these extra-mental causes are like. All that we can be sure of is "that there exist one or several transcendental realities, as real as we ourselves, which act upon us as causes, just as we ourselves act as causes upon them" (p. 219). This conclusion seems to Dr. Aveling "to be enough for all our purposes"; to others, on the contrary, it may well seem so lame and impotent as to be scarcely worth the trouble which he has taken to reach it.

A. K. Stout.

Mind and the World Order: Outline of a Theory of Knowledge. By CLARENCE IRVING LEWIS. Charles Scribner's: New York, Chicago, and Boston. Pp. xiv, 511.

THIS work may be regarded as a valuable contribution to the systematic 'debunking' (as we say in America) of the intellectualist tradition in philosophy, which is now proceeding apace more or less everywhere. Prof. Lewis won his spurs as a young man by a careful and penetrating study of the various systems of symbolic logic, which revealed that these, together with the mathematical conceptions with which they were associated, were all in ultimate analysis deductions from freely chosen (or 'arbitrary') assumptions (or 'postulates'), of which an indefinite plurality could be formed and which could be varied at pleasure. It thus appeared that their internal coherence had nothing whatever to do with their application to reality and scientific usefulness, and that the 'universal and necessary truth' which had played such a dominant part in the history of thought was simply a *confusion*, arising out of the conflation of two entirely distinct problems. The *uses* of mathematics and logic depended on the empirical fact that from some (more than *one*) of these mathematical and logical systems could be drawn a (more or less) *convenient* calculus for predicting the behaviour of empirical reality; but their '*necessity*' arose simply out of the conventional meanings assigned to their basic conceptions. Thus in themselves they were only word-games, which we might play or not as we liked, though a good sportsman would play them according to the established rules and would refrain from changing them without due notice. Thus all the far-reaching inferences which philosophers had been wont to draw from the universality and necessity of mathematics and logic were completely vitiated, and the foundations were laid for a new epistemology, of which the method was radically empirical and voluntaristic. As Prof. Lewis puts it (p. vii), "it has been demonstrated that the certitude of mathematics results from its purely analytic character and its independence of any necessary connection with empirical fact".

But of course such logical revolutions cannot be carried through without inflicting psychological wounds. Most philosophers had got deeply attached to the notion of the *a priori* (or at any rate to the *word*), and could not bear to part with it. They felt that to strip them of it was to fling them naked and friendless on an alien world. In order therefore to give no needless offence to these weaker brethren, some of the more prudent (or astute) of the innovators have from the first been willing to retain the word *a priori*—in a *new* sense. This is what Prof. G. F. Stout did long ago, in his essay on Error in *Personal Idealism* (1901), and what Prof. Lewis does in the present volume. In effect he offers a compromise to the tradition. He will continue the use of the '*a priori*,' if he is allowed to take it as purely the product of an ideal experiment, as a mere matter of definitions and the analysis of concepts. Hence it will follow that there will continue to be quite a number of '*a priori*' truths, of assertions that will hold of 'reality' prior to experience. For if any seeming 'reality' should fail to conform to our *a priori* demands we can always deny it the rank of 'reality'.

But beyond this the *a priori* has no jurisdiction. "The application of any particular concept to particular given experience is hypothetical; the choice of conceptual systems for such application is instrumental or pragmatic, and empirical truth is never more than probable" (p. x). Thus '*a priori*' is apt to be an empty honour. Scientific truth is 'synthetic' in Kant's sense, empirical, and merely probable, and even the most

obstinate determination to withhold the rank of 'reality' from such appearances as set *a priori* expectations at defiance may crumble under the relentless pressure of adverse experience, especially as, to accommodate it, we have usually to do nothing more than choose another *a priori* system.

Nor, finally, can the validity of Kant's fundamental problem be conceded. "That experience in general is such as to be capable of conceptual interpretation, requires no peculiar and metaphysical assumption about the conformity of experience to the mind or its categories; it could not conceivably be otherwise" (p. x). For "a mind such as ours, set down in any chaos that can be conjured up, would proceed to elicit significance by abstraction, analysis, and organisation, to introduce order by conceptual classification and categorial delimitation of the real, and would, through learning from accumulated experience, anticipate the future in ways which increasingly satisfy its practical intent" (p. 391).

For this doctrine Prof. Lewis propounds the name 'conceptualistic' pragmatism, which is clumsy, but may serve. He affiliates it especially to C. S. Peirce, whose manuscripts have come into the possession of Harvard University, and are being increasingly appealed to as a source of esoteric inspiration by its members, although the selections from them so far published hardly justify any very exalted estimate of their value. Whatever its sources, however, Prof. Lewis's pragmatism seems to be unexceptionable and of excellent quality. Hence the cavils which follow should be regarded merely as the captious ebullitions of an inveterate critic.

Prof. Lewis's remark on page 329 that the conclusion of deductive inference is as certain as the premisses seems to require modification in view of the slur cast upon the validity of the syllogism by Sidgwick's ambiguity of the middle, which reduces to probability the certainty of the conclusion in the abstract form. The doctrine (*e.g.*, p. 436) that "every proposition ought to be true or false under all circumstances" affirms an '*ought*' which is more easily demanded than effected. It overlooks also the priority of meaning to truth, and the frequent lack of meaning in formal propositions. In his anxiety to convince us of the value of probable reasoning Prof. Lewis seems sometimes to overshoot the mark. He contends that the probable judgment may be *valid* (in the strict formal sense ?), and if valid true, and if true absolutely true, and if once true always true (pp. 331, 332, 382). But his proof seems a bit sophistical, not to say verbal, like the proof given on page 268 that new and improved "categories and concepts" do not 'contradict' such as are antiquated and discarded. Prof. Lewis's explanation is that the *better* concepts are *other* than those they supersede, even when they are conveyed by the old names: the old concepts remain as true as ever they were. Aye, but *was* their 'truth' ever more than that of a verbally consistent play with definitions which have now been found not to apply to the real? Moreover I am at a loss to render his contention that "empirical and material truth is never more than probable" (p. 307), compatible with the ascription to it of the honorific predicates cited above. Nor can I discover Prof. Lewis's right to declare "given all the relevant data which there are to be known, everything is either certainly true or certainly false" (p. 330). Relevance implies selection and a possibility of dispute; so the notion of "all the relevant data" does not seem to go with something so formal as the principle of Excluded Middle. Lastly, I am unable to fathom how a denial of the formal principle of Contradiction or the discovery that "it was merely a verbalism" would entail the consequence that "nothing in experience possesses any stability" (p. 306). Surely on Prof. Lewis's own principles

the stability of nature would remain precisely what it was whatever postulates logicians played with.

On the other hand I have nothing but admiration for Prof. Lewis's contentions that, "it is the *a priori* element in Knowledge which is pragmatic, not the empirical" (p. 266), that "the *a priori* knowledge of universal principles does not secure any *a priori* knowledge of empirical particulars" (p. 315), that "a generalisation with very few exceptions is almost as good as one with none, as a basis for action" (p. 334), that "memory in general is *probable* knowledge" (p. 337), and that "in a world in which knowledge, as some have portrayed it, would be valid, intelligence would be unnecessary, since habit would be a universally safe guide" (p. 340). May I conclude by suggesting that both the points of coincidence and those of divergence between Prof. Lewis and myself are so marked and important that not only I but also logicians generally will be eager to get from him an expression of opinion on the doctrine of *Logic for Use?* It is certainly high time that progressively-minded thinkers should get together and consider in detail just how much of the old formal logic is worth keeping.

F. C. S. SCHILLER.

A Manual of Psychology. By G. F. STOUT. Fourth Edition; revised, in collaboration with the Author, by C. A. MACE. London: University Tutorial Press, Ltd., 1929. Pp. xx, 680. 12s. 6d.

WE all regret that Prof. Stout has not been able to produce by himself the fourth edition of a book that has made such a place for itself in the teaching of psychology; but our regret is tempered with pleasure at the way in which Mr. Mace has performed his ungrateful task. Despite the number of quotations (some well and some badly selected) the *Manual* has a distinct unity and style of its own; and Mr. Mace has succeeded in making considerable minor alterations without damaging that unity, and in a manner deserving of the highest praise.

The principal changes are mentioned by Mr. Mace in his Introduction. The exposition of "the growth of the perception of the external world" has been amplified (by Mr. Stout himself) in the hope of avoiding some misunderstandings. It is no longer assumed that "the simplest datum of sense-perception from which the cognition of an external world can develop consists, not merely in a sensuous presentation, but in a sensuous presentation apprehended as conditioned by something other than itself" (3rd edition, p. 432). Instead the problem is now stated in terms of "original meaning"—"present sensation originally 'means' for the percipient corresponding characters of the physical object" (p. 412). Another innovation is the reference to the *Gestalt* theorists in the discussion of the perception of form, about which (in the *Analytic Psychology*) Mr. Stout has, to say the least, thought along similar lines. A point of interest is the increased emphasis laid in this edition upon the "activity-factor" in perception (and indeed in all mental process): Mr. Stout's assertion that "the perceptual category is always purely and immediately practical in its operation" (p. 422) and the tone of the book generally display what may reasonably be called a pragmatic tendency.

The use of the word "presentation" by Stout has been a stumbling-block to those brave students who read him and Ward's *Psychological Principles* concurrently. Ward used the word in the sense of Locke's "idea"—"nothing but the immediate object of our minds in thinking"

(*ibid.*, p. 46). This sense may perhaps be described as metaphysically neutral. Stout in his *Analytic Psychology* (1896) used it for "a more or less specific modification of the thinker's individual consciousness which defines and determines the direction of thought to this or that special object" (vol. i., p. 47), which is a metaphysically mental sense. The *Manual* has oscillated between these two usages. The first edition (1898) defines it as "whatever constituent of our total experience at any moment directly determines the nature of the object as it is perceived or thought of at that moment", which tends towards neutrality, since a constituent of a thing need not share all its characteristics. In the second edition (1901) "presentation" is distinguished from "object" as being a "varying appearance assumed by an object recognised as the same during the process of attending to it" (p. 58), which may be metaphysically anything according to the nature of the "assumption". The third edition (1921) takes it more seriously. The preface states categorically that, as against Ward, "presentation" is the only convenient term to use for "a certain special kind of object, possessing a distinctive character and function of the utmost importance", and that the use now at last conforms to that of the *Analytic Psychology*. It is introduced by a distinction between "the states, acts or functions of attending, desiring, liking, willing, believing, etc., and that which is attended to, etc.," the former being called (psychologically) "subjective" and the latter "objective" (p. 8). "Presentation" is then defined as an "immediate experience which is primarily objective" (p. 11). In this fourth edition (1929) the distinction between "subjective" and "objective" is repeated (p. 8); but it is no longer followed by an application to "presentations". Indeed the word has disappeared completely from the book. It is therefore surprising to find Mr. Stout confessing in the Preface to his *Studies in Philosophy and Psychology* (1930) that his use of "presentation" for "that element in the object which is immediately experienced" "has caused so much difficulty and misunderstanding that in the latest edition of my *Manual* I have fallen back on the use of the term 'presentation' originally proposed by Ward, as corresponding to Locke's 'idea'" (p. x)! "Presentation" seems to be leaving the philosophical world in a manner as mysterious as its connotation.

The singular behaviour of the word in this new edition (as Sherlock Holmes would have described it) is important in its bearing on what Mr. Stout thinks to be the metaphysical status of "sensations". For however "presentation" is defined, the definition has always been intended to include sensations. And the withdrawal from the use of presentation for something essentially mental suggests a retreat from the position that sensations are mental; and this view is supported by several passages in the book. For example, "sensum" is used throughout the book as a synonym for "sensation", and the statement that "sensations not only exist *for* the mind as objects of thought: they also exist *in* the mind" (3rd edition, p. 209) has been deleted. Instead we are told that we have no right to assume that "they have any intrinsic resemblance to subjective experiences, or that they are 'modifications of the mind' or 'states of consciousness'" (p. 123). Mr. Mace in his Introduction suggests that Mr. Russell would differ from Mr. Stout about the atomicity of sensations rather than about their metaphysical status; and an apology is made for declining to replace "sensation" altogether by "sensum" on the ground that the latter term "is closely associated with the special doctrine that the sensum is the object of a distinctive 'act of sensing,' which in contrast with the sensum is to be described as 'mental'" (p. 10 n.).

Nevertheless, whether the act of sensing is or is not "distinctive", Mr. Stout has distinguished at the outset acts from their objects and thus his position is radically different from Mr. Russell's neutral monism. While these psychologically objective sensations continue to be described as "immediate experiences" (instead of, for example, constituents of immediate experience), they must be taken to be mental. Mr. Stout now admits that they are material as well (*Studies*, p. vii), but is as far as ever from giving a satisfactory reason for their mentality.

I will make some final remarks on how the book appears to me as a manual of psychology. In many ways it is admirable: it is so sensible and so rightly emphasised. Yet when I tell my students that it is the best book on psychology, I always wish that there were a better. For the *Manual* is so unconstructive: it contains hardly any of those generalisations which it is the aim of psychology as a science to discover. Of course this is chiefly the fault of the present state of psychology: there are very few fundamental laws or concepts that are generally accepted, so that introductory books are almost bound to be accounts of rather petty laws (*e.g.*, Woodworth), expositions based on a disputable theory (*e.g.*, McDougall) or philosophical analysis. The *Manual* is almost entirely this analysis and criticism of naïve psychological notions. It is a prolegomena to a psychology more than a psychology itself. And can the prolegomena be written before there is a science? If Mach had criticised the notions of force and mass before, instead of two hundred years after, Newton used them so successfully, would mechanics have been strangled in its cradle? Yet now Mach is clearly right. How much does an infant science require safeguarding from philosophers until its products have begun to make their way in the world? A little, I suspect.

Also Mr. Stout seems to me to be too ready to agree that such and such a subject cannot be treated psychologically. The *Manual* closes on this defeatist note. "Psychology cannot explain how it is possible that an individual can consciously mean or intend something. . . . Will and thought are not explicable by such categories as causality, substance, resemblance, or correspondence" (p. 654). This comes perilously near to Mr. Joseph's dictum that empirical psychology ("psychology as one of the special sciences") "can perhaps explain everything that comes to be in the mind, except knowledge and action" (MIND, N.S., vol. xxxviii. p. 42). If Mr. Stout attempts to explain perception in spite of Mr. Joseph's conviction that this is impossible, why should not he try to explain will and thought also? It is the lack of faith of theoretical psychologists in the possibilities of their subject which drives hopeful students into the arms of an "intuitive" Köhler, a bumptious Watson or a coldly fascinating Freud.

R. B. BRAITHWAITE.

The Meaning of Rousseau. By ERNEST HUNTER WRIGHT. Oxford University Press, 1929. Pp. vi + 168. 8s. 6d. net.

THE author of this book, who is Professor of English in Columbia University, has set out, with considerable success, to complete for Rousseau's writings as a whole the work which such students as Vaughan and Beaulavon have begun for the political treatises—namely, to defend them against the charges of inconsistency so constantly levelled against them, and to account for the widely opposed influences which they have had both on thought and practice. His intention is to trace the main stream of Rousseau's doctrine

amid the cross-currents which may always be expected in a writer whose thought develops as he writes; to put in their proper place the misleading flashes of paradox which by their very brilliance too often obscure the issue; and to distinguish the different universes of discourse of statements which if made with the same reference would be, and have often been taken to be, flatly contradictory. His book consists, therefore, almost entirely in sympathetic exposition and interpretation, carefully and competently done; but the reader is sometimes left in doubt where the one ends and the other begins, and the references provided to the original texts are too scanty to help him. What criticism there is is of Rousseau's critics rather than of Rousseau. "We are not trying to prove Rousseau right or wrong so much as to say merely what he means" (p. 21). But we are left with the impression that the author thinks him on the whole right rather than wrong. Although Prof. Wright admits that Rousseau invites misinterpretation in the special ways which he points out, he puts the main burden of blame on the critics. It is partly that Rousseau's appeal is so wide that each specialist assumes him to be speaking his own language and dealing with his own problems. "Thus his idea of the natural man, basic as it is for all his thinking, may well mean one thing to the anthropologist who takes this man for the first human being of all time, another to the psychologist who thinks of him as the essential man of any time and yet another to the moralist who may look upon him as the last man still to come and wear the crown of all our culture" (p. 5). But a more important source of misinterpretation and censure has been the prejudices of the critics against the iconoclast, which have made their criticisms read like political pamphlets. Prof. Wright claims no more than to have read Rousseau over a long period without prejudice; and this book is the fruit of his reading.

"Nature is right." In these words he finds the key to Rousseau's thought. In the first chapter he brings together all that Rousseau has to say about what is 'natural' in man and shows in what sense he maintains the natural to be also 'right'; and in the remaining three chapters he discusses in succession Rousseau's view of the education, the society and the religion best suited to develop man's natural goodness, or good 'nature'. The last three chapters are in the main expositions of the *Émile*, the *Social Contract* and the *Savoyard Vicar's Confession* respectively. But the first pieces together fragments of doctrine into a connected whole which "is not to be found intact at any given place in Rousseau's work" (p. 30). It is in this chapter, therefore, that the failure to give detailed references to the original texts is likely to cause most inconvenience to the scientific student of Rousseau. Yet it is this first chapter which perhaps breaks the newest ground in the interpretation of Rousseau. On the meaning given to the term 'natural' depends, Prof. Wright realises, the whole of Rousseau's argument. Greek thought distinguished between 'natural' as meaning 'primitive' and as meaning 'what is best for the species'. Rousseau, according to Prof. Wright, combines the two meanings. The natural is the ideal, but "we have no way of finding the ideal for any being without first discovering his native bent and aptitude, without first asking of his nature what his end should be" (p. 21). The natural in the sense of 'primitive' or 'necessary' gives the clue to the natural in the sense of the ideal. In man self-love and pity are the primary instinctive elements; from their conflict is born conscience (but Prof. Wright does not help Rousseau to tell us how), and along with conscience, to carry out its dictates, reason develops. All that fosters these natural elements and prevents them

from degenerating is itself 'natural', however 'artificial' in any other sense of the word it may be. If self-love degenerates into a pride which despises others not as successful as ourselves, then so far we have ceased to be natural and have left the path of development towards the best that we have it in us to be. We must return to nature—that is, "cast away a world of illusion and rediscover our own self" (p. 21). The *Emile* paints the natural man—"no mere primeval brute, but a man of our own day or rather of a future day" (p. 32)—the *Social Contract* describes the form of society in which alone such a man may come to be, and the *Savoyard Vicar* preaches the natural religion, "to which we may all come if we listen only to our sentiment and reason" (p. 32).

Prof. Wright is confessedly dealing "with the Rousseau who is still alive in our day" (p. 64) and is therefore justified in omitting "incidental inconsistencies and minor absurdities" (p. 65), but his anxiety to defend his author against unjust attacks sometimes leads him, especially in dealing with the *Social Contract*, to overlook or minimise more fundamental inconsistencies. For instance, he makes the point that the social contract for Rousseau, embodying as it does the terms on which alone a state worth calling a state can come to be, is not something actually made in the past, but an ideal to be realised in the future; but he does not point out how often Rousseau himself appears to forget this, as when he speaks of the clauses of the contract as "everywhere the same and everywhere tacitly admitted" (*C.S.* I., vi.), or when he introduces the divine law-giver to advise a people who, in Prof. Wright's own words, are "just beginning as a people" (p. 79). (Prof. Wright oddly describes Rousseau's introduction of the law-giver as "a stride into the practical" (p. 80); but even Rousseau himself confesses him to be a miraculous antidote to the blindness of the general will.) Again, he rightly warns his reader that in omitting much of the practical application in which Rousseau clothes his principles—his "concrete counsel"—as mainly "truism," and devoting more attention to the principles themselves, he is in danger of giving a misleading idea of the balance of the book (p. 79). But he adds that "the practical detail is inessential. . . . Nothing in [it] will affect the idea of the state" (p. 86). This is not altogether true. Rousseau's practical application of his principles falls so far short of their promise that there is an apparently irreconcilable discrepancy between what Prof. Wright calls respectively the abstract and concrete sides of the *Social Contract*. The only obvious way of accounting for it is by assuming that we are apt to make more than Rousseau intended out of the Sovereignty of the General Will, and all that it implies. This discrepancy is noticeable particularly in his account of the relations which are to hold in practice between the sovereign people and the government. In theory the sovereign people is to be the vital principle of the body politic, the source of all law, the initiator of every general policy, while the government is to do no more than particularise and apply their decisions. But when we come to the detailed account of their respective functions we find that of the people represented more and more as being merely to act as a check upon the government, in whose hands apparently lies the all-important task of preparing the business on which the Assembly is to vote. The *raison d'être* of the Assembly appears to be in practice to prevent the government from abusing its power. Whether such a body can in any proper sense be called a Legislative Assembly is doubtful; but in any case the account which Rousseau gives of its powers is in striking contrast with the glorification of the Sovereignty of the General Will which forms the main theme of the 'abstract' part of the

treatise. By passing over the practical application Prof. Wright conceals from himself and from his readers an apparent inconsistency which deserves at least as close attention as some of those with which he successfully deals. He admits "weakness" in the latter part of the *Social Contract* (p. 106), but the fact is that there is more than weakness: there is a surprising and challenging contradiction, which suggests a review of the accepted implications of the earlier part. Could Rousseau have meant all that he seems to mean by his principles when he so completely fails to apply them? We should have liked an answer to this question from Prof. Wright.

The style in which the book is written may at times prove irritating to some readers. There are, as is natural and right in an American writer, American idioms (*e.g.* 'back of' for 'behind'). But it has also faults which one would not expect from a student of Rousseau. A rather pretentious extravagance of phrasing and a tendency, not always successful, to strain after rhetorical effect, run through the book (to take examples at random, 'exceeding few men' is preferred to 'very few men' (p. 21), 'whether of the twain' to 'which of the two' (p. 116); and on p. 11 Hobbes appears as 'the sage of Malmesbury'). But these peculiarities are never allowed to obscure the writer's meaning, and he sometimes achieves a pregnant and memorable phrase or metaphor worthy of his author. His book may be recommended not only as an exposition for those who are not closely familiar with Rousseau's writings, but to students of Rousseau as a further bulwark against the tide of criticism which is now at last beginning to turn. There is a useful bibliography of the more important works dealing with Rousseau, which might with advantage have been supplemented by a chronological list of Rousseau's own writings and a guide to the most authoritative texts and editions now in print.

A. K. Stout.

L'Année Psychologique. Vingt-neuvième Année. H. Piéron. Paris, Librairie Félix Alcan. Pp. xvi + 946. 120 fr.

This number, like the last, appears in two parts, but the paging is continuous. It contains as usual original memoirs, 'notes', and a bibliographical analysis of psychological literature in all fields. The bibliography itself fills some 700 pages. The volume of psychological literature has become so great that without the aid of some such analysis as that given annually in *L'Année Psychologique* no one could hope to keep abreast of the various developments of the science.

The original papers are eight in number. They are nearly all experimental, and more specialised in their appeal than usual. In the first, entitled "Le problème des impressions de mouvement consécutif d'ordre visuel", G. Durup discusses the phenomena of visual after-sensations of movement, and the various explanations which have been suggested. The paper is a very useful summary of the facts and the theories, without adding much that is new to our knowledge. The author concludes by pointing out that there are two distinct problems involved, the problem of the processes determining after-movement of the field, which are probably muscular, and the problem of the retinal processes in "mouvement consécutif projeté". The article is very long, occupying more than fifty closely printed pages.

The second memoir is entitled: "Contribution à l'étude des facteurs

régissant le taux de sommation des impressions lumineuses de surface inégale". It is by N. Kleitman and H. Piéron, and is in a high degree specialist in character. The question the authors ask themselves is: What is the influence of the surface of excitation on the limen of brightness, for chromatic and for achromatic perception, employing white light or monochromatic light of different colours, under conditions of dark or light adaptation, for different retinal regions? The experiments were carried out with Polack's Perimeter-Photoptometer, and tables and curves showing the results are given. The general finding is that if one leaves out of account the small foveal region, where only cones, each attached to individual neurones, are found, no simple law can be formulated to express the influence of the retinal surface stimulated, because of the heterogeneity of the surface as regards distribution of rods and cones, and connexion with optic fibres.

M. Foucault next contributes a memoir on "Les inhibitions internes de fixation". The author discusses the various sources of inhibition affecting the memorising of a series of words or syllables. He first distinguishes between "external" and "internal" inhibition. As an example of "external" inhibition may be cited the well-known phenomenon usually spoken of as "retroactive" or "regressive" inhibition, first studied by Müller and Pilzecker. If one learns a series of words just up to the point of immediate reproduction, and then turns at once to the learning of a second series, this second learning exercises an inhibiting influence—"une action d'effacement"—on the associations, etc., established in the first learning. Two other forms of "external" inhibition can be found, the second resulting from carrying on another piece of mental work simultaneously with the learning—called by Foucault "concomitant" inhibition—and the third an inhibition exercised by the first piece of learning on the second, which shows itself in an increase of learning time—called by Foucault "progressive external" inhibition. There are also "internal" inhibitions, that is, inhibitions having their source within the series itself which is being learned, and it is mainly these to which Foucault wishes to draw attention. The presence of each new image, as words are learned, exercises an inhibiting influence on the older images. This is analogous to the "regressive" inhibition of Müller, except that it has its origin within the series itself. It may be called "regressive internal" inhibition. There is also a type of inhibition which may be called "progressive internal" inhibition, which, as in the case of the "external" inhibitions, is the converse, as it were, of the "regressive". Experiments are described which have as their object the isolation and measurement of these two types of internal inhibition.

The fourth paper, by Madame Piéron, is devoted to the discussion of a French standardisation of the "Barcelona test". The test itself—an intelligence test—is not given, which is rather a pity. Altogether 3017 subjects were tested, of whom 2374 were boys, representing primary, secondary and higher schools in France, and 643 girls, similarly representative. Percentile results for all ages from 13 to 21, and for both sexes are given. The results show a slight superiority of the boys at most ages.

The next three articles deal with kindred problems in different sense departments. All are highly technical and specialist in character. A. Fessard discusses the effect of short tactile stimulation—"Le problème des excitations tactiles brèves"—H. D. Bouman and P. Kucharski discuss the influence of the duration of sounds upon their timbre—"De l'influence

de la durée des sons sur leur timbre "—and H. Piéron studies what may be described as a side problem in his work on sensation time in vision—"Les lois du temps du chroma des sensations lumineuses. La Méthode." All may therefore be said to be concerned with the time factor in sensory experience, the first with the effect on the tactual threshold of shortening the time of stimulation, the second with the conditions under which a change of timbre is produced with notes of different frequencies by shortening the time during which the stimulus is allowed to act, the third with the evolution of chroma in visual sensations as a function of time with different intensities of stimulation and with reference to the Benham-Fechner phenomena. All represent merely the beginnings of investigations.

The last paper is the only theoretical paper in the volume. Here D. Bertrand-Barraud discusses the part played by language or verbal images in the definition and organisation of thought—"Le langage et les articulations de la pensée". The paper is interesting, but cannot be said to contain much that is really new. The author contrasts what he calls "instinctive" thought with reflective thought, taking the first to be characteristic of animals and of very young children, and goes on to consider the nature of consciousness and the development together in one single movement, as it were, of language and rational thinking.

The original memoirs are followed by three 'Notes' by H. Piéron. The first of these is on: "The rôle of the phenomena of contrast in the combination of heterogeneous fields of binocular vision", the second on: "The influence of the composition of the light on the nature of the Fechner-Benham subjective colours". The third describes three new pieces of apparatus, a colour mixer in which the sectors can be adjusted during rotation, a simple apparatus for measuring reaction time, called by Piéron the "chronoptoscope", and a modification of the pursuit pendulum of Miles.

JAMES DREVER.

Text-book of Logic. By A. WOLF. London: George Allen & Unwin, 1930. Pp. 407. 10s.

LOGIC is one of the world's greatest bugbears. It is as 'inexorable' as death. Its 'validity' is as strong as the united strength of all the sciences, because at heart it is 'pure'. It is 'irresistible', 'cogent', and mysterious. Even among philosophers few are fond of reading it and probing into its mysteries. Practically it is a traditional item in the academic curriculum, but only in a very elementary, attenuated and stereotyped form, which the labours of generations have rendered superficially easier than elementary mathematics, and which can be rendered sufficiently entertaining to be tolerated by those who can be amused by playing with words. Consequently every professor of logic with a sufficient *clientèle* is tempted to write a text-book of elementary logic; and their name is legion. The interest and value of these productions, however, can best be estimated by observing how far they take into account the extensive and incisive criticism to which Formal Logic has been subjected in recent years, and have been able to utilise it to improve the statement and to modify the assumptions of this venerable discipline. In so far as they fail to do this they are merely handbooks of a pseudo-science which is really nothing but a word-game.

Now in his 'jacket' Prof. Wolf claims to have produced something "very different from the usual run of text-books on logic" and "likely to be more helpful to students and teachers". According to the Preface

also "logic is here treated consistently and adequately as the study of the main types of reasoning and the general conditions of their validity. All topics not strictly relevant to these problems are omitted. At the same time, many types of reasoning not included in other text-books are dealt with here. Thus the usual obstructions are removed, and the usual deficiencies are made good, so as to enable the reader to have a clearer and more comprehensive view of the whole field. Moreover, the exposition of the subject is more systematic and coherent than is usual. Strange though it may appear, text-books of logic are among the chief sinners against the canons of logical method."

Clearly Prof. Wolf is determined not to be identified with these black sheep. Among the merits which he claims, however, the most difficult to substantiate is probably *consistency*. For whereas it used to present the appalling appearance of an effective chimæra, with the leonine roar of deductive logic in front, backed up by a solid body of 'inductions', and tailing off into serpentine coils of probability, with a real sting, behind, Formal Logic nowadays usually degenerates into a bleating goat in front, grotesquely grafted on a lion's trunk, with a tail reduced to a vermiform appendix, so that the whole incongruous combination is fit to excite derision rather than apprehension. Prof. Wolf's doctrine also appears to suffer from similar misfits. His recognition of Probability (chap. xxii.) and Circumstantial Evidence (chap. xvi.) is distinctly meritorious, while the seventy-six pages of exercises are a welcome tribute to the practical side of Logic. His account of 'inductive' logic also, while conventional enough to pass muster as reasonably 'orthodox', evinces a competent grasp of scientific method. His version of deductive logic is at any rate brief enough to be excused from plunging into the depths and difficulties which criticism has revealed.

But it is in the composition of his chimæra that discrepancies arise, and his stitches often come undone. Thus in his treatment of 'Induction' he has been wise enough to take the advice given in my *Formal Logic*, to render its doctrine at least superficially defensible by introducing the notion of *relevance* into its 'canons,' and he has even added a brief but sound discussion of this notion (pp. 221-222). But this hardly justifies him in forthwith appealing to it elsewhere, as he frequently does (pp. 20, 21, 32, 45, 78, 96, 116, 314, 319). In spite of his admission (p. 222) that "it is impossible to indicate any definite and reliable mark of relevance", he evidently has not fully grasped how *fatal* Relevance is to all Formal Logic. Moreover he does not consider the cognate and equally subversive problems of Meaning and Ambiguity, and does not abandon the Formal notion of 'Validity' (*v.* above) and the pretensions of 'logic' to 'exactness'. Nor is there any mention of Sidgwick's Ambiguity of the middle term and its deadly effects upon the claim to validity of the syllogistic form. Yet there is not a little pragmatism in Prof. Wolf's doctrines. Thus he insists strongly (p. 120) on the need of applying logical formulas to concrete cases. On page 132 he takes identity as similarity sufficient "for practical purposes." He repeatedly disclaims the construction of 'fool-proof' procedures. He admits (p. 154) that "Knowledge was born in the service of life; it was, and in many ways still is, an instrument of life," that (p. 275) "there is no finality in human knowledge, not even in scientific knowledge," and that (p. 286) "if science is to avoid every suggestion of anthropomorphism, it must be dumb." Finally (p. 304) the Uniformity of Nature is reduced to a 'hope', partly "the result of a practical drive felt by mankind." (*Cf.* also chap. i., p. 40 and p. 307 f.). Of course one must confess that

these passages are jostled by others which retain 'intuitions', 'cogency' and 'pure disinterested' science, and can only be regarded as relics of rationalism, while the faint pretence that (formal) logic is concerned with judgments rather than with propositions is dropped after chapter ii. Of the notorious 'Laws of Thought' Contradiction and Excluded Middle are affirmed without discussion, though Identity is passed over.

On the whole Prof. Wolf's compromise seems likely to increase the growing doubts as to whether it is prudent for conservative philosophers to go on teaching Formal Logic. For however artfully they may maintain their conspiracy of silence towards any radical criticism of the Formal tradition, however skilfully they may slur over its incongruities and hush up its failures, it is not really a defensible subject. So soon as it ceases to be treated as a pure word-game and makes the slightest concession to the demands of common sense and science, it is ruined. And the more intelligent the youthful students of 'logic' the more rapidly will they see through it, and recognise it as a pseudo-science.

F. C. S. SCHILLER.

The Evolution of Truth and other Essays. By HOWARD V. KNOX, M.A. London: Constable & Co., Ltd., 1930. Pp. viii + 180. 10s. 6d.

IN this book Captain Knox has republished eight papers contributed by him to philosophical journals between the years 1900 and 1920. Their republication in a more convenient form will be welcomed by those who enjoyed them when they first appeared. This procedure, however, has its dangers. In the first place, even philosophical papers are apt to lose their interest with the passage of time. The present collection, we should immediately add, does not suffer in this respect. We found even the earliest contributions lively enough; partly, we think, because of the pleasant style of the author and, partly, because of the uncompromising stand which Captain Knox makes for his philosophical faith. But, again, one frequently finds in collections of this kind a tedious repetition of like arguments, especially if the papers are written on the same theme and from the same point of view; and the present work is not wholly free from this second defect. At the same time it may be held that a good argument, like a good story, is fully worthy of repetition.

The author, as is well known, is an ardent disciple of William James, and perhaps no one has claimed as much for James as Captain Knox has done. For instance, at the end of the paper entitled 'The Philosophy of William James' he writes: "After all, James might well be content to rest his title to fame on his having translated the question 'What makes knowledge possible?' into the question 'What makes knowledge credible, and conduct possible?'. That is what in the history of philosophy will be known as James' Answer to Kant, and there are those who believe that it will rank as more epoch-making than Kant's irrelevant Answer to Hume" (p. 114). All these papers preach James' Pragmatism, either by attempting a positive statement of it, or—more frequently—by attacking opposite views. Most of the papers are polemical in character, and it is only occasionally that we find Captain Knox' positive beliefs expounded. The book is fittingly closed with a paper entitled 'Is Determinism Rational?', which contains more positive teaching than most of the earlier papers. The argument of this paper is repeated in Captain Knox' recently published work *The Will to be Free*, which has already been reviewed in MIND. Of

the seven papers which remain two deal directly with William James, discussing his philosophy and his letters respectively; two attack the Absolute Idealism of T. H. Green; the fifth attacks Mr. Bradley; the sixth the heretical Mr. J. B. Pratt, whose book (reviewed here by Captain Knox) "presents a novelty to science in that its author is the first known case of a convert *from* pragmatism" (p. 82); while the seventh is entitled 'Pragmatism: the Evolution of Truth'.

The book is, perhaps, more of a polemic against Absolute Idealism than a positive statement of Pragmatism, and like many another of its kind it sometimes goes to excesses. Here, for instance, is a statement that should have been modified: "Whereas Locke was trying to understand the nature of the human understanding and the way it grew up, it never seems to have occurred to Green that the *human* understanding was a subject worthy of human study" (p. 118). His point is that Green's interests lay in the determination of the 'spiritual principle' in knowledge. But surely Green interested himself in this principle simply because of his intense desire to explain *human* knowledge, and to say that Green thought human understanding to be a subject unworthy of human study is directly to contradict the actual facts of the case. The argument of the book is, we think, marred by rather foolish over-statements of which the above is one, but not, unfortunately, the only example. We must complain also of the tendency to identify Rationalism with Absolute Idealism even in the later papers, and to argue as if once Absolute Idealism has been overthrown Rationalism itself has also been overthrown. This false identification of Rationalism with Absolute Idealism greatly simplifies Captain Knox' problem. If we understand his main argument correctly it can be reduced to the following propositions. There exist two schools of thought, the Rationalist and the Pragmatist. Now for the Rationalist the only finally true knowledge is that of the Absolute; consequently if we are to have truth at all it must be the whole Truth. But (on the Idealists' own showing) our finite mind cannot know the whole Truth. Therefore, it follows that we can know nothing with absolute certainty. We must then either say that the finite mind never gains truth or, with the Pragmatists, that 'truth' for us is something relative and not at all absolute. Now Mr. Bradley has already given the Idealist answer to this criticism. Our own objection is that the above argument does not put before us the genuine alternatives. For Absolute Idealism is not the sole type of Rationalism. There are Rationalists who believe the human mind capable of certainty quite apart from any philosophy of the Absolute. The actual fact of the matter is that we are *not* compelled to choose between Absolute Idealism and Pragmatism.

At the same time, Captain Knox might claim that the Idealist School wields far less influence over English thought in 1930 than it did when he set out to attack it in 1900. Yet, if Idealism has been superseded in England, it can hardly be said that Pragmatism has established itself in its place. The view that the 'true' is what 'works' or, again, what people accept because it best suits their purpose at the time, does not seem to be gaining ground amongst responsible English philosophers. It is so obvious that 'true' is an adjective we only use when we meet with a certain theoretical compulsion of a definite kind. The 'true' is what we are compelled to accept, whether knowledge of it be useful or not, and Captain Knox in this book seems to disregard this element of compulsion and necessity. In so far his analysis of the cognitive experience, as also the metaphysic he builds upon it, is surely defective.

R. I. Aaron.

Die Religion in ihrer dogmatischen und ihrer reinen Form. By LEO HAMBURGER. München: Reinhardt, 1930. Pp. 170. M. 7.50.

IN this solid but somewhat abstract book, Herr Hamburger contrasts two kinds of religion, the "dogmatic" and the "pure". Occasionally, instead of "dogmatic" he says "historical". But he scarcely does enough to explain what either dogmatic or historical means. If dogmatic be a description attaching to any religion that makes positive or doctrinal statements about Reality, it might with perfect justice be applied to the pure optimism to which eventually he gives his adherence, for to assert that the world is definitely valuable is as much a doctrine as anything can be. And the term "historical", as used in discussions of this sort, is radically ambiguous. A religion may be called historical because (like Christianity) it has a vital connexion with certain events believed to have happened, but also because it has played a part in the past of the world. Hinduism is historical in the second sense, not in the first. Hamburger leaves us more than a little uncertain in which sense he is using the word.

The three parts of the book treat successively of the essence of religion, the normative laws obtaining between religious thinking and valid knowledge, and the demands which may legitimately be imposed on the "extra-intellectual" element that goes to constitute religious life.

A moment ago it was urged that Hamburger leaves the reader in some doubt as to what "dogmatic" means, and this is true of his main argument. There is, however, an early sentence which professes to make things clear but rather adds to confusion. "We call a religion dogmatic", says the writer, "which in any of its conceptual parts contradicts valid knowledge, we call it pure when its theoretical basis is scientifically trustworthy." But here again, may it not be reasonably held that a religion (like Christianity) may be dogmatic and yet contradict nothing that science has *proved*, while pure optimism might be denied the certificate of science, and yet, as a faith, be none the worse for that?

After rejecting various suggestions, Hamburger defines religion as an emotional attitude to the world as a whole. He fails to take account of the fact that to show that religion and knowledge are not to be equated still leaves it a very real possibility that knowledge may be a vital element within religion. Besides, the definition just stated makes all argument useless. If religion be, as such, just an emotional attitude to the world, obviously a dogmatic religion is a corrupt form of it. As the argument proceeds, however, it becomes more and more doubtful whether knowledge or belief can be excluded. Even the extraordinarily question-begging assertion on page 26 that "dogmatic religion is an emotional attitude to an imaginary world, pure religion to a perfectly real one", suggests that however pure the religion it is still bound up with belief.

Warm praise must be given to those parts of the book which deal with optimism and pessimism. Every religion, it is contended, must hold by one of the two, for it must either find or not find pleasure in the world of experience.

Hamburger insists on rejecting transcendence as no fundamental religious idea, and unwisely urges that when Hegel taught the opposite he was guilty of a *contradictio in adjecto*. Another of his positions is that religion lies beyond the distinction of true and false; but the psychology of this is more than doubtful, for every believer feels the truth of his beliefs to be a matter, for him, of life and death. Later in the argument, the

emotional attitude in which religion is said to consist turns out to be valuation. *Das religiöse Gefühl ist Wertgefühl* (p. 83). A vain attempt is made to exhibit the object of religious emotion as merely immanent, as if pure immanence and pure transcendence exhausted the field of choice. *Weltbezogen* is not as such *weltlich*. There is no more transcendent word in the vocabulary of religious faith than "creation", yet it manifestly implies a real relation to the world. The kind of ideal religion Hamburger has in view is immanence-philosophy touched with emotion, an attitude from which all impulse to *worship* has departed. And can this have any real bearing on what religion has actually been and done in human life?

Hamburger's ethical position is very much that of Nietzsche—the older thinker made consistent, he would say. There is no categorical but only a hypothetical imperative. *Werde, der du bist!* This scarcely encourages us to hope that actual religion will be deeply understood, for as Söderblom points out even the primitive *tabu-mana* system implies the idea of unconditional obligation.

Where Hamburger's thoughts on religion seem most awry is in his tendency to speak of it as something that man does for himself. Pure optimism is religion at its best, and man is to make himself an optimist by wise management of his will. The crucial question, we are told, is whether man can produce in himself love of the world (which is the one thing needful) by his own resources. If he can, his triumph is complete. "The religious task of man is the self-production of his fate by will" (p. 156). Anything less calculated to throw light upon the meaning of religion, as distinguished from a high sort of magic or auto-suggestion, could not easily be imagined. Not self-exploitation but the responsive feeling of dependence on a power higher than we, is the inward sense of religion.

H. R. MACKINTOSH.

Principles of Experimental Psychology. By HENRI PIÉRON. Translated by J. B. MINER. International Library of Psychology, etc. Kegan Paul. Pp. viii + 190. 10s. 6d.

PIÉRON'S excellent and comprehensive little book, *Psychologie Expérimentale*, in the "Collection Armand Colin", is sadly mangled in this translation. Again and again we come across sentences and phrases which are ambiguous or unintelligible—sometimes pure nonsense—and we are driven back to the original to see what Piéron does say. The trouble begins in the Preface and is continued practically to the last page. In the first paragraph of the Preface the translator writes: "having more especially to do with the human being who interests us in practical life". The ambiguity disappears when we read in the French: "en ayant plus particulièrement égard a l'homme civilisé normal, qui, pratiquement, nous intéresse davantage". On page 18 we find the sentence: "Mechanical stimuli (vibrations in particular) and chemical stimuli, the radiations which they set up when they are absorbed, heat or photo-chemical activities, all affect Infusoria as well as man". What on earth does it mean? Again Piéron's statement is clear enough: "les stimulations mécaniques (vibrations en particulier) et chimiques, les radiations qui engendrent, quand elles sont absorbées, des actions thermiques ou photochimiques, sont efficaces sur les Infusoires comme sur l'homme". On page 46 the translator tacks on to a paragraph the words "in themselves

to give it its specificity", which do not seem to have any meaning, and are not represented in the original at all. On page 51 there is a lovely sentence: "The puncture among morphine addicts by its painful excitation, is an element which often complicates the toxicomania for the person morbidly afraid of pain". One cannot help wondering what the translator thought this meant. If it means anything it is more or less the opposite of what Piéron says. The words are: "La piqûre, chez les morphinomanes, par l'excitation douloureuse, est un élément qui complique souvent d'algophilie la toxicomanie". Let one more sample suffice. On page 80 we read: "Let us increase the objective intensity of a stimulus, for example, by letting down on the skin of a finger pins held in equilibrium on their points. For a weight of a milligram any reaction may be recorded by repeating the excitation a hundred times. Let us admit that for a weight of five milligrams, 25 times in 100 a contact will be acknowledged; for a weight of six milligrams, perception will occur 50 times in 100; for a weight of seven milligrams 75 times in 100; and for a weight of eight milligrams 99 times in 100." No one who had not an independent knowledge of the facts could ever make out what this meant. Piéron's own statement is quite straightforward and free from difficulty: "Faisons croître l'intensité objective d'un stimulus, par exemple en utilisant, pour les déposer sur la peau d'un doigt, en les tenant en équilibre sur leurs points, des épingles, de plus en plus lourdes; avec un poids d'un milligramme, aucune réaction ne peut être obtenue en répétant 100 fois l'excitation. Admettons que, pour un poids de cinq milligrammes, 25 fois sur 100 un contact sera accusé, etc."

These examples only give one a very faint idea of the vices of the translation. It is throughout very slipshod, and the meaning is frequently obscure. In fact the translation is incomparably more difficult to understand than the original, even for a person who has little more than a smattering of French. It must be admitted that Piéron's French is by no means easy. It is too compressed to be easy. Things can hardly be otherwise when an attempt is made to put so much into so small a book. Nevertheless it is highly unfortunate that the English reader should make Piéron's acquaintance through a translation like the present. It is a pity something cannot be done to prevent this kind of thing happening. Several recent German writers have had similar reason to complain. Why will people attempt translations, whose knowledge of the language, and possibly also of the subject-matter, is inadequate?

As for the book itself, though it is quite impossible to recommend the translation, the original is an excellent account of the present position in psychology. As we should expect, it is written from the point of view of the experimentalist. Experimental psychology, however, is widely interpreted. Piéron himself is known mainly for his valuable and important work in the field of psychophysics, but here he does not by any means confine himself to that field. All the modern developments of psychology are discussed from a point of view, which he designates "experimental", but which might be more fittingly described as biological or broadly behaviouristic. The first chapter deals with the notion of reaction or response, and the whole framework of the modern science is, as it were, built on this as a foundation. The treatment is illuminating and original, and the little book as published in the "Collection Armand Colin" can be warmly recommended. In any case without this no one will be able to make head or tail of the translation.

JAMES DREVER.

The Book of Diogenes Laertius: Its Spirit and Its Method. By R. HOPE. New York: Columbia University Press, 1930. Pp. xiv, 241. $3.00.

THE author explains in his Preface that the aim of his essay is to provide "an introduction to the book . . . and an analysis of the thought-pattern underlying its composition." I think he is probably too sanguine in supposing either that such an analysis is adequately accomplished in his own pages, or that it is feasible to execute one with the present data of expert opinion. Before the "pattern" of the work can properly be submitted to analysis at all, we need to be sure that the book known to us as the *Lives of the Philosophers* really has an underlying pattern, and owes its present form to the controlling mind of a single author or reviser. And this seems to me more than can be asserted with confidence in view of the wide divergence of the critics on every question connected with the immediate sources of the book, and the date and character of its final redaction (if it ever received such a redaction). Thus, to take an illustration of the kind of difficulty to be faced, the life of Plato seems inspired by a marked enthusiasm for Platonism and that of Epicurus by an equal admiration of Epicureanism. May we infer that it is a personal characteristic of "Diogenes," whoever he was, that he felt a strong preference for two such unlike philosophers? Or must we explain away the laudation of Epicurus as ironical, taking the appreciation of Plato at its "face-value"? Or finally, should we explain the facts by supposing that the praise of Plato and that of Epicurus belong to different original sources which have been flung together by a mechanically working compiler? Clearly our view of the personality of "Diogenes," his interests and purposes, will depend very much on our answer to this critical question, and Mr. Hope's own second chapter is an eloquent proof of the wide range of disagreement on such matters between equally competent scholars. It seems to me, then, that it is premature to attempt the task outlined in Mr. Hope's Preface until the *complete* text of "Diogenes" has been competently edited from the best MSS. with a full *apparatus criticus*, and a real measure of unanimity reached about his proximate sources and the amount of editing they have undergone in his work as we have it. Meanwhile, Mr. Hope's review of the history of the text, and of the controversies of the *docti* about its sources, in the first two chapters of his essay, has a real value as revealing the intricacy of the critical problems which still await solution. Mr. Hope offers no solutions of his own, whether from modesty, or from a conviction that the opinions of one *vir doctissimus* are neither more nor less likely to be true than those of another.

In the remaining four chapters an attempt is made, while leaving the critical problem in abeyance, to draw conclusions from the text as we have it about the preferences of "Diogenes" among philosophers, the aspects of philosophy, and the features of the biographies of philosophers, in which he is most interested, the precise purpose with which his collection has been formed, and the kind of circle of readers it presupposes. Obviously, none of these conclusions can be regarded as final until the prior critical problem has been settled. I am not certain that Mr. Hope does not rather overlook this when he presents some of his results as established by "statistics" about the number of times a given author is quoted or a given topic mentioned in his text. But the amount of labour entailed by the compilation of these statistics must have been great, and they are always suggestive and agreeable. The amassing of them is a piece of industrious work for which students of "biographical doxography" will

be sincerely thankful. There are occasional things in the book which look like awkward slips in scholarship, like the confusion of Xenophanes with Xenophon on page 181, or the remark at page 132 that "Diogenes" condemns the style of Socrates as unskilful and that of Aeschines as slovenly. (The remark about Socrates really refers, of course, only to his unsuccessful attempt in the prison to versify a fable of Aesop, and the other censure only concerns the apparently spurious διάλογοι ἀκέφαλοι ascribed by some to Aeschines.) Similarly, it is Mr. Hope, not "Diogenes," who ascribes the "discovery of the cube" to Archytas (p. 187). What "Diogenes" speaks of is the discovery of the "duplication of the cube," a very different matter. Some of these slips, like the appearance of such forms as ἐπαινοῦσθαι, or σωκρατογόμφους (as nominative) are presumably due to the printer, but one wonders a little that they should have passed the reader of a University Press.

A. E. TAYLOR.

The Interpretation of Religion: An Introductory Study of Theological Principles. By JOHN BAILLIE, M.A., D.Litt. Pp. xv, 477. T. & T. Clark, 1929. 14s. net.

DR. BAILLIE is a professor of systematic theology in the University of Toronto, and in this substantial book has set himself to provide a very complete and thorough philosophical introduction to theology. There are two parts, the method and the inquiry. In the former, he discusses the scope of theology and its relation to other studies. In the latter, he reviews theories of the nature of religion, the characteristics of belief, the criterion of religious truth, and the ideas of God and of revelation. This will be recognised as a formidable programme, and it is carried out in a way that leaves little to be desired as to completeness. It is not an arm-chair book, by any means, but Dr. Baillie is not weightier than his purpose demands, and is never obscure at any rate.

The author's own conception of religion is set forth in terms of value. It is "a confident reference of our values to the real order of things". But this he takes to be too vague to serve for more than a general philosophical characterisation of religion. He therefore seeks to give the grounds of belief, and traces religious certitude to the personality as a whole, not merely to an intellectual conviction. It is not easy to see, however, why Dr. Baillie so strongly objects to calling the religious point of view a hypothesis experimentally verified. He says that the process which confirms it is the same as that which suggests it. Not necessarily so, surely, for belief may be suggested by authority, tradition, or other factors, but ultimately become a conviction based on personal experience. Dr. Baillie calls faith the choice between two alternatives, but since there is no point in speaking of alternatives unless both may conceivably be true, it follows that neither is so evidently right that it excludes the possibility of the other being right. A hypothesis is a statement of possible relationship, and it is difficult to see how choice between alternative possibilities is different from choice between hypotheses, in such circumstances.

The next step is to deal with the idea of God, a chapter which seems to me to fall somewhat below the level of the rest. All is based on a moral argument that is not strongly put, and one imagines would produce little impression on any unconvinced inquirer. The critical and historical

portions of the book are stronger than the constructive. In the chapters on God and on revelation, Dr. Baillie falls back on remarks about the history of these doctrines at the moment when it seems necessary to discuss their basis and philosophical validity. A more definite separation of the two aspects would have been an advantage throughout. One is glad, however, to extend a welcome to this book as an honest and candid attempt to think out and set down the theory of religion. It is odd that every man seems to think himself capable of expressing opinions worth listening to on the subject of religion. Hence the number of books written by literary men, scientists, and others, on religion, which an avid public buys, persuaded that the opinions of a distinguished physicist or historian must have weight in this matter, though the last thing they would do would be to take the theologian seriously, if he made excursions into science. To read a book like this, is a needful reminder that a knowledge of the kind requisite for expressing an opinion upon theological questions intelligently, does not come by the light of nature, and one could wish that our amateur theologians would apprentice their minds to these pages, which would provide them at any rate with some conception of the extent of the field into which they make light-hearted excursions, and of the wide historical, psychological and philosophical knowledge required of the modern theologian.

E. S. WATERHOUSE.

A Study of the Principles of Politics: Being an Essay towards Political Rationalisation. By G. E. G. CATLIN, M.A., Ph.D., Professor of Politics in Cornell University. London: George Allen & Unwin. Pp. 469. 18s. net.

THIS book is a continuation of a recently published volume entitled *The Science and Method of Politics*, in which the aim of Political Science was defined as being to describe, without ethical judgments or presuppositions, and by methods analogous to those of the natural sciences, the acts of men in their quest for power. And its object appears to be the further elaboration of these views of the status and methodology of Political Science (Part I.) and their application to the discussion of some of its major problems (Part II.). Part I. does not add much, and Prof. Catlin would probably not claim that it did, to the arguments of the earlier volume, beyond substituting 'control' for 'power' as the chief end of men in their political endeavours, and therefore the chief concern of the 'politicist.' Special efforts are, however, made to show that control can be of many kinds, and in particular that it is not confined to the dominance of men over one another but is also to be found in co-operation between them. And in Chapter III. an interesting critical discussion is offered of the various 'political laws,' in the sense demanded by Prof. Catlin's conception of scientific method, that have been suggested by various thinkers, including one of his own formulation.

Part II. is much longer, and presumably more important, covering ground that was not explored in the earlier volume. But, in view of the large scale and elaborate pretensions of the book, it is difficult not to be disappointed with it. It is very loosely connected with Part I., and might indeed have been written in entire independence of the methodology there advocated. 'Political laws' are not formulated or illustrated, except incidentally; and the only consistent feature of Prof. Catlin's

method seems to be the repeated use of a somewhat misleading analogy, already suggested in the earlier volume, between political and economic science. He makes, it is true, some effort to adhere to his intention of describing only what actually happens or is likely to happen; but he cannot altogether avoid passing moral judgments, or in other way transcending the somewhat narrow conception of Politics which he has imposed upon himself. Nor are his actual discussions, though based on wide reading and carried out in considerable detail, in themselves satisfactory. Indeed, his wide reading and elaborate attention to detail seem to have made it difficult for him to develop, and certainly do not make it easy for the reader to discover, anything like a coherent or continuous argument, whether in the Part as a whole or in any one of its five long chapters. Chapter VII., for example, on Equality and Status, consists almost wholly of a disconnected series of discussions of the equality of, and possible conflicts between, different kinds of groups (age groups, sex groups, race groups, interest groups, and groups of various other kinds), and makes little reference to political theory or any other kind of theory, either to support the detailed points which are made about each group, or to suggest a general thesis about all of them. These discussions and similar discussions in other chapters (for example, that about sovereignty and the nation-state in Chap. VIII.) are often interesting enough in themselves; indeed, they constitute the chief merit of the book. But even in them the large number of books which Prof. Catlin appears to have read seems to have been more often than not a disadvantage to him, seducing him into irrelevant or unnecessarily elaborate discussions and tempting him to burden his pages with redundant footnotes.

There are a number of misprints and other minor inaccuracies, especially in the footnotes, but perhaps no more than might be expected in a book of this character.

O. DE SELINCOURT.

Stufen der Personalität. By WALTER EHRLICH. Halle, Max Niemeyer, 1930. Pp. 165. M. 8, bound.

THIS work contains a number of striking ideas that may prove very helpful in elucidating philosophical problems, though it is to be regretted that the author has not developed them with greater fullness. In my opinion he would have done better either to lengthen the book or to omit altogether some of the points discussed in order to give himself space to set forth the others more adequately, and I certainly feel that the book might have been made much clearer, though this is an accusation that would perhaps be brought, at least by a foreigner, against most recent German philosophers.

The work is primarily epistemological, and starts with a classification and distinction of the various possible attitudes to nature (romantic, mythological, etc.), followed by a determined attempt to separate the fact of knowledge from any relation of causality. In the way it is expressed the argument sometimes goes so far as to seem to imply that the state of mind involved in knowledge is not determined by causality in any way, but this is not in fact the author's intention. What he wishes to emphasise, so far as it can be expressed briefly, is that a thing may figure in two different planes, the scientific plane of becoming and causal connection, and the epistemological plane in which, as object of knowledge, it has a being outside the causal chain, though its entry into the

second plane may be conditioned by an event in the first plane. The relation in knowledge between consciousness and object he maintains to be indefinable, not because it is unknown, but because it cannot be reduced to any other relation, and is in particular totally different from the relation of causality, and he emphasises very strongly the importance of this relation for philosophy. It might be objected that the name which he gives, *Zuordnung*, is not the most appropriate, and that it is too suggestive of the correspondence theory, but this is perhaps mainly a question of words as the author in practice emphasises the directness of the knowing relation and does not expose himself to the charge of confining the mind to its own ideas. He holds that our view of knowledge is very much distorted because we are so used to the causal view of the world that we have difficulty in thinking at all a relation which is not causal.

Dr. Ehrlich then proceeds to discover by analysis of our experience various successive stages of personality. Most elementary and lowest is the purely individual, then comes the inter-subjective, the existence of which is proved by the fact that different men have experiences in common, then a third is revealed in certain higher experiences, but hardly attained by most men. It is to be regretted, however, that the account of the third stage is very difficult to follow. He then works out the distinction between two aspects of man as on the one hand a natural being swayed by desire, and on the other hand a " transcendental " being capable of freedom and knowledge, and distinguishes further grades in our higher experiences. In general the book shows ability and considerable originality, though as regards the latter the claim implied in the first page that the view of knowledge expressed is radically different from any previous one will not hold water.

A. C. EWING.

Logik der Philosophie, Grundzüge einer Umgestaltung der Formalen Logik. By PROF. DR. ARTHUR LÜNEMANN. Braumüller, Vienna and Leipzig, 1929. Pp. vii, 127.

PROF. LÜNEMANN, being justly disgusted with the " bloodless and soulless aridity " of the text-books of Formal Logic and the miseries of teaching it, has set himself to compile another which ' will of course completely transform ' it (p. 82), and publishes this work by way of Prolegomena. Perusal of it, however, engenders a strong suspicion that it might have been more in place as an *epilogue*, if, that is, he takes the trouble to explain in his text-book, and to bring within the grasp of the meanest or school-boy intelligence, the series of catch-words which in this book he merely flings about, and leaves his reader to apprehend, if he can. As matters stand his highly technical and obscure discussions take for granted that every one understands what he means by ' Intuitikon ' (which strikes one merely as a horrible hybrid), ' Funktionsynthese,' ' Wahrheitsmöglichkeit,' ' Logik der Philosophie,' ' voraussetzungsloser Transzendentalismus,' ' Wesenserfassung,' ' heterologisch,' etc. When he has explained what meanings precisely he wishes to attach to these phrases, it may be possible to consider the value of his arguments, though even then his fondness for the traditional German confusion which is called ' Vorstellung,' his addiction to the demand for ' purity,' his denunciations of ' psychologism ' which like (or unlike) nature perpetually recurs to trouble German logics and is never exorcised, and his habit of dignifying merely verbal ' propositions ' with the title of ' judgment,' do not augur well for the success of

his enterprise. But it must be admitted that in the course of his book he develops a very pretty talent for *scolding*, and exercises it upon all the logicians he knows, including all the German writers of the last fifty years. In view of this it is perhaps fortunate that he has evidently never heard of the systematic psychologism of pragmatist logic; should he ever encounter it, speech would probably fail him altogether!

F. C. S. SCHILLER.

Histoire de la Philosophie. É BRÉHIER. Tome II., *La Philosophie Moderne, I. le dix-huitième siècle.* Paris: F. Alcan, 1929. Pp. 314. 20 fr.

ONE is glad to receive a further instalment of M. Bréhier's interesting and scholarly history of Philosophy from the earliest times to our own day. It is an excellent feature of the volume that M. Bréhier by no means confines himself to the "big men," or to men whom it is traditional to classify as "philosophers". Pascal, Bayle, Fontenelle, for example, all come by their rights in this very living picture of the currents of thought in the seventeenth century. Naturally enough, the Cartesian succession is dealt with at some length, and M. Bréhier has found room to give his countrymen brief, but substantially accurate, information about such particularly English groups as the "Cambridge Platonists" and the "deists". To myself it is a welcome and long due innovation in a bad tradition that Malebranche is treated not in the account of the successors of Descartes, but independently on his own account, and in the right chronological setting, *after* Spinoza. I think that, as one would expect in a French historian, Descartes is treated with the maximum of *gusto*, and after Descartes, perhaps Spinoza; but M. Bréhier reveals everywhere a wide and sympathetic study of the whole field. Naturally enough, in so long a narrative, there are incidental slips of chronology and the like, in dealing with non-French thinkers. Thus Milton's *Areopagitica* was published not "in 1647 after Cromwell's victory" (? Naseby), but in 1644; the "third book" of the *Temporis Partus Masculus* (mentioned on p. 37) is a work unknown to me, and, I suspect, to every one else; the remarks about "Cabalistic philosophy" alleged to be taken (p. 32) from Bacon's account of the *idola tribus* really belong to that of the *idola theatri*. Charles II. was not "restored" in 1651 (p. 144), unless by "restoration" M. Bréhier means to allude to the farcical coronation at Scone as "covenanted" King of Scots. The date of publication of Hobbes's *de Cive* is variously and inaccurately given in different places (the first and the expanded edition being apparently confused). His *de Corpore* was published not in 1661 (p. 146) but in 1655. The A. in the name of Locke's deistical friend Collins stands not for Arthur (p. 293) but for Anthony. (M. Bréhier has confused two contemporaries.) A welcome feature of the volume is the comparative fullness of the bibliographies appended to the different sections. The very excellence of these bibliographies makes the omission both of *Joachim's Study* of the *Ethics*, and of Höffding's *Commentary* on the work, rather remarkable in the case of Spinoza. I think it a pity also that Kemp Smith's *Studies in Cartesian Philosophy* and Latta's *Monadology of Leibniz* receive no mention. But these are small defects in a very deserving book. The dreadful *luctifera* (for *lucifera*) on page 36 is, no doubt, a creation of the compositor.

A. E. T.

Cattell Group Intelligence Scale: Specimen Set. By R. B. CATTELL. London: G. G. Harrap & Co., Ltd. 3s. 6d.

THE Cattell Group Intelligence Tests are divided into three scales, for ages 8-11, 11-15, and 15 upwards. This division is a point in their favour. They are constructed according to five principles, of which the three first and most important are:

(*a*) To include only those types of test already proved to be most highly saturated with *g*.

(*b*) To expect only a bare minimum of (general) knowledge on the part of the subject as a working basis for the mental operations dealt with by the test.

(*c*) To assume a much more limited vocabulary than has hitherto been demanded in most intelligence tests.

The importance of (*a*) will be recognised by all who are familiar with Prof. Spearman's *Nature of Intelligence*; (*b*) and (*c*) denote an improvement on most of the well-known American tests.

Apart from this, Scales II. and III. include the usual type of question on Analogies, Classification, Completion, Inference, Synonyms and Opposites, and there seems little to say about them except to hint at a suspicion that Tests 1 of Scales II. and III. are almost equally difficult—a suspicion which cannot be verified, as Messrs. Harrap, contrary to their usual generosity, have failed to include the table of norms in their specimen set—and to commend the addition of pictorial analogies and classifications.

Scale I. is more tentative, and more interesting. It consists of eleven tests, which, by including the "Ballard" type of question [Absurdities, Orientation, Puzzles (4), (5), (8); Riddles (10), which seem entirely new; and Picture Completion (11)], make a more varied, less fatiguing test than usual for the very young. The items of the various tests are on the whole well-chosen, but ambiguities are present in certain of them, *e.g.*, Test 4 (6) (a good case can be made out for either answer), Test 9 (5) (meaning of "just"), Test 10 (6) ('I do not come down from the sky' can be taken to mean 'I stay up in the sky'). In Test 8, items (7) and (8) are clearly in favour of those children who by the age of 11 have learnt a little elementary Algebra. Test 3 is confusing: the examples given are not true samples of the items. The child is liable to be troubled by the dotted spaces, and to waste his time in trying to fill them mentally before answering.

The only general criticism to be made is against the time element. If there is a time limit at all, it should only be in questions so long that no competitor can hope to reach the end, and *it should not be mentioned on* the test itself. To tell a child that he has $3\frac{1}{4}$ minutes in which to do a test is apt to lead to his completing it in about a third of that time, often to the obvious detriment of his answers.

A reviewer of American tests must view with suspicion any addition to the two or three dozen standardised tests on the market, very few of which seem any better than any other. A reviewer of English tests has not this apparently unnecessary reduplication to contend with. Dr. Ballard alone has produced a series of tests comparable in range with the Cattell Tests. Only time can show whether the latter rival in accuracy of prognosis Ballard's Columbian, Chelsea, and Crichton Tests.

D. M.

Received also :—

É. Gilson, *Études sur le rôle de la pensée médiévale dans la formation du système Cartésien*, Paris, J. Vrin, 1930, pp. 342, 40 fr.

W. Healy, A. F. Bronner, and A. M. Bowers, *The Structure and Meaning of Psychoanalysis*, New York, A. A. Knopf, 1930, pp. xx + 482 + xxiv, $5.00.

J. Bonar, *Moral Sense*, London, G. Allen & Unwin, Ltd., 1930, pp. 304, 12s. 6d.

G. F. Stout, *Studies in Philosophy and Psychology*, London, Macmillan & Co., Ltd., 1930, pp. xiii + 408, 15s.

F. H. Bradley, *Appearance and Reality*, 9th Impression, Oxford, Clarendon Press, 1930, pp. xxi + 570, 16s.

B. Petronievics, *Hauptsätze der Metaphysik*, Heidelberg, C. Winter, 1930, pp. 82, 5 M.

A. Spir, *Esquisse de Philoscphie Critique*, New Edition, Paris, F. Alcan, 1930, pp. xvi + 168, 15 fr.

H. Urtin, *Vers une Science du Réel*, Paris, F. Alcan, 1930, pp. viii + 122, 12 fr.

J. Thyssen, *Die philosophische Methode : Erster (Gegenstandstheoretischer) Teil*, Halle (Saale), M. Niemeyer, 1930, pp. 263, M. 12.

C. A. Strong, *Essays on the Natural Origin of the Mind*, London, Macmillan & Co., Ltd., 1930, pp. vii + 304, 12s.

A. O. Lovejoy, *The Revolt against Dualism*, London, G. Allen & Unwin, Ltd., 1930, pp. xii + 325, 15s.

W. Lutoslawski, *The Knowledge of Reality*, Cambridge University Press, 1930, pp. xvii + 203, 7s. 6d.

L. F. Anderson, *Gottes Logische Welt*, Leipzig, F. Meiner, 1930, pp. 287, M. 7.80.

W. W. Spencer, *Our Knowledge of Other Minds*, New Haven, Yale University Press (London, H. Milford), 1930, pp. 145, 9s.

C. C. J. Webb, *Our Knowledge of One Another* (Annual Philosophical Lecture, British Academy, vol. xvi.), London, H. Milford, 1930, pp. 18, 1s. 6d.

W. D. Lighthall, *The Person of Evolution*, Montreal, H. A. Kennedy & Co., 1930, pp. 216.

A. S. Pringle-Pattison, *Studies in the Philosophy of Religion*, Oxford, Clarendon Press, 1930, pp. vi + 256, 12s. 6d.

H. Rashdall, *God and Man*, Selected and Edited by H. D. A. Major and F. L. Cross, Oxford, B. Blackwell, 1930, pp. 264, 6s.

H. H. Brinton, *The Mystic Will*, New York, The Macmillan Co., 1930, pp. xiii + 269, $2.50.

E. S. Waterhouse, *Psychology and Religion : A Series of Broadcast Talks*, London, Elkin Mathews & Marrot, 1930, pp. xxii + 232, 5s.

O. L. Reiser, *Humanistic Logic for the Mind in Action*, New York, T. Y. Crowell Co., 1930, pp. x + 326, $3.00.

H. H. Dubs, *Rational Induction*, Chicago, University of Chicago Press, 1930, pp. xv + 510.

P. Painlevé, *Leçons sur la Résistance des Fluides non Visqueux*, Paris, Gauthier-Villars & Cie., 1930, pp. iv + 183, 40 fr.

B. Christiansen, *Die Kunst*, Buchenbach i. Br., Felsen-Verlag, 1930, pp. 260.

M. J. Nicolson, *Art and Sex*, London, Mitre Press, pp. 97, 5s.

W. W. Willoughby, *The Ethical Basis of Political Authority*, New York, Macmillan Co., 1930, pp. viii + 460, 15s.

E. Jordan, *Theory of Legislation*, Indianopolis, Progress Publishing Co., 1930, pp. 486.

S. Freud, *Civilization and its Discontents*, translated by J. Riviere, London, Hogarth Press, 1930, pp. 144, 8s. 6d.

N. Dombrowski-Ramsay, *La Morale Humaine et la Société des Nations*, Paris, F. Alcan, 1930, pp. 122, 12 fr.

R. Schaerer, ΕΠΙΣΤΗΜΗ et ΤΕΧΝΗ *: Étude sur les notions de connaissance et d'art d'Homère à Platon*, Macon, Protat Frères, 1930, pp. xii + 220.

G. A. Gaskell, *Hellenic Scriptures Interpreted*, London, C. W. Daniel Co., 1930, pp. 239, 7s. 6d.

S. N. Dasgupta, *Yoga Philosophy in relation to other systems of Indian Thought*, Calcutta, University of Calcutta, 1930, pp. x + 380.

M. Guéroult, *La Philosophie Transcendentale de Salomon Maïmon*, Paris, F. Alcan, 1929, pp. 178, 30 fr.

M. C. D'Arcy, S.J., *Thomas Aquinas*, London, E. Benn, Ltd., 1930, pp. ix + 292, 12s. 6d.

G. Bruno, *Cause, Principe et Unité*, translated by E. Namer, Paris, F. Alcan, 1930. pp. 218, 20 fr.

H. Metzger, *Newton, Stahl, Boerhaave et la doctrine chimique*, Paris, F. Alcan, 1930, pp. 332, 40 fr.

Moses Mendelssohn, *Gesammelte Schriften : Jubiläumsausgabe, Bd. VII*, Berlin, Akademie-Verlag, 1929, pp. clxxxiii + 516, M. 12.

T. Litt, *Kant und Herder als Deuter der geistigen Welt*, Leipzig, Quelle und Meyer, 1930, pp. vii + 291, M. 10.

G. della Volpe, *Hegel Romantico e Mistico* (1793-1800), Florence, F. le Monnier, 1929, pp. viii + 229.

F. L. Bertrand, *Alfred Binet et son œuvre*, Paris, F. Alcan, 1930, pp. v + 335, 30 fr.

G. Gurvitch, *Les Tendances actuelles de la Philosophie allemande*, Paris, J. Vrin, 1930, pp. 234, 25 fr.

J. Segond, *Traité de Psychologie*, Paris, A. Colin, 1930, pp. 501, 45 fr.

R. H. Wheeler, *Readings in Psychology*, New York, T. Y. Crowell Co., 1930, pp. x + 597, $3.75.

L. Klages, *Les Principes de la Caractérologie*, translated by W. Real, Paris, F. Alcan, 1930, pp. xi + 263, 35 fr.

H. André, F.-J.-J. Buytendijk, G. Dwelshauvers, M. Manquat, *Vues sur la psychologie animale*, Paris, J. Vrin, 1930, pp. 173, 20 fr.

K. Bühler, *The Mental Development of the Child*, London, Kegan Paul, 1930, pp. xi + 170, 8s. 6d.

E. R. Jaensch, *Eidetic Imagery*, translated from the 2nd edition by O. Oeser, London, Kegan Paul, 1930, pp. 136, 7s. 6d.

B. Hart, *Psychopathology*, new and enlarged edition, Cambridge University Press, 1929, pp. 178, 8s. 6d.

B. Hart, *The Psychology of Insanity*, 4th edition, Cambridge University Press, 1930, pp. xxxv + 176, 3s.

H. Wallon, *Principes de psychologie appliquée*, Paris, A. Colin, 1930, pp. 224, fr. 10.50.

F. L. Bertrand, *L'Analyse psycho-sensorielle et ses applications à l'éducation intégrale*, Paris, F. Alcan, pp. 300, 40 fr.

E. Croner, *Die Psyche der weiblichen Jugend*, 5th edition, Langensalza, H. Beyer & Söhne, 1930, pp. 92, M. 2.25.

Dr. Hermann, *Krankhafte Seelenzustände beim Kinde*, 3rd completely altered edition, Langensalza, H. Beyer & Söhne, 1930, pp. xv + 252. M. 7.80.

T. Ziehen, *Die Grundlagen der Charakterologie*, Langensalza, H. Beyer & Söhne. 1930, pp. viii + 372, M. 9.

E. Schneider, *Psychoanalyse und Pädagogik*, Langensalza, H. Beyer & Söhne, 1930, pp. 72, M. 2.30.

H. Koch, *Das Generationsproblem in der deutschen Dichtung der Gegenwart*, Langensalza, H. Beyer & Söhne, 1930, pp. 116, M. 3.

M. Döring, A. Lorber, H. Post, H. Scheucher, and O. Tumlirz, *Die Jugendlichen und ihre Erzieher : II*, Langensalza, H. Beyer & Söhne, 1930, pp. 49, M. 1.30.

G. Pfahler, *Eros und Sexus*, Langensalza, H. Beyer & Söhne, 1930, pp. 42, M. 1.25.

T. Michelson, *Contributions to Fox Ethnology : II.* (Smithsonian Institution Bureau of American Ethnology, Bulletin 95), Washington, Government Printing Office, 1930, pp. 183.

M. Livingston, *The New Nuctemeron*, London, Rider & Co., 1930. pp. 143, 4s. 6d.

I. Grant, ed. by, *Conversations with the Other World Telepathy in this*, London, Williams & Norgate, Ltd., 1930, pp. 91, 2s. 6d.

E. Cailliet, *La Prohibition de l'Occulte*, Paris, F. Alcan, 1930, pp. 206, 15 fr.

A. M. Hollen, *Songs of the Soul*, Hollywood, Calif., Keats Publications, 1930, pp. 95.

J. Lefrancq, *L'Ordre et la Vie Intérieure* (équilibres, 1re Série, Nos. 2 and 3), Brussels, F. Larcier, 1930, pp. 58, 15 fr.

Arctos : Acta Historica Philologica Philosophica Fennica, Vol. I., Fasc 1-2, Helsingfors, 1930.

VII.—PHILOSOPHICAL PERIODICALS.

JOURNAL OF PHILOSOPHY. xxvii. 8. **F. S. C. Northrop.** 'Concerning the Philosophical Consequences of the Theory of Relativity.' [Modern science had inherited from the Greeks (1) an *atomistic* physics designed to overcome the antithesis between Heraclitus and Parmenides, (2) the *mathematical* theory called Platonism, and (3) the *functional* theory developed by Aristotle out of the biology of Hippocrates. Galileo and Newton based their physics on atomism, but complicated it with four absolutes, space, time, gravitation and the ether. The theory of Relativity destroyed these absolutes, but it remained a physical theory; "it has nothing whatever to do with general philosophical relativity or with human minds". Nevertheless it has the important philosophical consequence that the physical theory "is left without any meaning for atomicity and motion". Also it is very difficult to find a basis for measurement. At present, "Einstein would define space-time in terms of matter. This is the physical theory of nature. Eddington would reverse the relationship. This is the mathematical theory. And Whitehead would regard matter and space-time as abstractions from a monistic process of becoming" which is identical with a functional theory. The conclusion is that the universe "must be constituted not only of the moving microscopic atoms . . . but also of one large macroscopic atom, spherical in shape and hollow in its interior".] xxvii. 9, 10. These two Numbers contain an important discussion of Dewey's philosophy which took place at the American Philosophical Association's meeting in December, 1929. **W. E. Hocking** leads off with what is perhaps the best criticism of pragmatism ever published. Admitting that "Dewey's philosophy is not a set of propositions, but a national movement," and that "just because America is *not* instinctively pragmatic that pragmatism has had, and still has, much fighting work to do," the author explains why he is "not wholly satisfied". For he does not find the correspondence between meaning and working to be as complete as he feels entitled to expect from the pragmatic criterion of truth. "To every proposition there may be attached an indefinite variety of workings; to every working, in turn, a variety of meanings." So "the working-test of truth is in a perilously loose relation to the proposition tested," and inferior to any more direct test. Moreover, "instrumental confirmation can always be had for a proposition which is only partially true". The denial of *eternal* truth also is objectionable. We need "*stability* in propositions" and 'eternity' means the limit to which stability tends. Hence 'eternal' and even 'transcendent' truths have great efficacy. Similarly we need '*a priori*' truths which can never be tested but are assumed whenever we try to test them. Dewey himself recognises "the value of trying to realise value" as such an invariant value. The paper concludes with a plea "for the recovery of a Platonic element in our way of knowing. . . .

Knowing and doing are not the same thing: nothing but confusion can be got from identifying them, for in that case activity itself could not be known. No doubt they are of a piece, inseparable: they reach their culmination together; knowing is at its height at the point where the present deed plays against the outer reality." **Prof. C. I. Lewis** follows with a paper on 'Pragmatism and Current Thought,' which accepts pragmatism as a movement not a system, a method not a doctrine, and attributes to it "a wealth of philosophic consequences". It implies an empirical theory of knowledge, and rules out a good many metaphysical theses. "The pragmatic test of significance" is "obviously valid and final," and rules out empty verbalisms. The functional theory of knowledge "is implicit in the notion that truth and meanings are something *to be tested*". But at first sight the pragmatic principle seems to lead to incongruous consequences. On the one hand its empiricism seems to favour a view of knowledge as immediate: on the other, to limit the meaningful to what can be tested seems to imply that "concepts are abstractions, in which the immediate is precisely that element which must be left out". This difficulty is illustrated from modern physics which makes great use of the pragmatic test. For the problem of Relativity is simply the problem of James's squirrel. Ultimately "immediately apprehensible matter dissolves into mathematics," or into "pointer-readings," which are "a conveniently hybrid sort of reality". But the purpose of such procedures is to handle concrete reals. This solves the conflict. "In one sense—that of connotation—a concept strictly comprises nothing but an abstract configuration of relations. In another sense—its denotation or empirical application—this meaning is vested in a process which characteristically begins with something given and ends with something done—in the operation which translates a presented datum into an instrument of prediction and control." No. 10 opens with a paper by **J. Ratner,** on 'John Dewey's Theory of Judgment,' which points out that for Dewey the starting-point for logic is the problem, and not a 'proposition' torn from its context and psychological conditions. The logic of propositions suffers from the same defects as the realist metaphysics of 'sense-data'. "Sense-data are not the originally 'given' in perception but the derivatively 'taken' in reflection," not 'pre-analytical' but 'post-analytical'. "Just as the realist metaphysician naïvely accepts the sense-datum as a piece of 'infallible knowledge' and so starts on a journey of sorrow, so the realist logician as naïvely accepts the proposition as the bearer of eternal truth or falsity and starts on a similar journey." But propositions "like definitions and postulates, are neither true nor false," and "philosophers should start with a question, with a hypothetical judgment instead of an assertoric proposition alleged to be eternally true". Finally, the claim of symbolic logic to be non-Aristotelian is denied. "It is certainly an advance on Aristotelian logic; but it is an advance on the same road. . . . Instrumental logic, on the other hand, is . . . a new type of logic." Next **Prof. F. J. E. Woodbridge** in 'Experience and Dialectic' complains that there are two strains in Dewey's philosophy. The one gives a straightforward account of the Knowing experience which is convincing; the other argues dialectically that all other accounts are wicked and wrong. To Woodbridge this does not seem to follow. Finally **Dewey** replies. Accepting Ratner and Lewis, and explaining that he is no foe of abstraction but merely regrets the proneness of inquirers into human affairs to be so overawed by the physical sciences as "to fail to develop the conceptions or abstractions appropriate to

their own subject-matter," he explains to Woodbridge that he does *not* deny antecedent reals in a cognitive situation but denies merely that they are *objects* of knowledge: they are the *data* from which knowing starts. As for his 'dialectic,' it is used to meet a "belief in immutable existence" which is "an emotional preference dialectically supported". In reply to Hocking he protests against conceiving truth as "an inherent property of some meanings, ideas, or propositions," and points out that Hocking's 'half-truths' are his 'meanings in process of development'. Part of the meaning may be verified, but such verification is not a half-truth; it is the whole truth of that part of the meaning. Secondly, he denies that "meanings, apart from their application through operations, are more than *claims* to truth". 'Clearness,' 'self-evidence,' etc., are only "properties of *meanings*". Thirdly, 'eternal' means "both irrelevancy to time and enduring through all time" and 'stability' "represents an ideal *limit*". But it must not be converted into an eternal truth. Fixed dogmas work—like the truths of paranoiacs, but disastrously. Lastly, empirically *a priori* meanings are not denied. They are 'meanings-as-postulates' but not 'truths'. xxvii. 11. **P. Hughes.** 'Forms of Generalisation and their Causes.' [Points out that scientific principles cannot all be stated in the form 'If X, then Z.' In many subjects we can only state *sine qua non* conditions in the form 'If non-X, then non-Z,' and in human affairs we can get only statistical laws of probability. This explains the comparative failure of experimental psychology and the success of the biographic methods of Galton, Binet, Terman and Stern.] Contains also two long reviews by Profs. Urban and Laird of each other's recent works on Value, of which Laird's is highly delectable. xxvii. 12. **J. Loewenberg.** 'Are Relations Effable?' [Points out the discrepancy between the relations actually experienced in specific contexts and the relations abstractly talked about. The latter involve two paradoxes, that of 'insulation' and that of 'substantivisation'. The former consists "in isolating elements from the complexes in which *alone* they can be found and then treating them as if their meaning in isolation were the same as that which they enjoy in the contexts they inhabit". But this destroys their meaning. Relations are "transactions . . . between ideas or between things," and their office is to relate. "Relations not relating are simply words which signify nothing at all." Similarly 'terms' must not be insulated. "For as soon as we insulate relations from their terms they cease to be what they are necessarily experienced as being—transitive acts or states, dynamic transactions or expressions, functional connexions or conjunctions, presupposing terms *between* which to move or to operate. How can one speak of equality apart from objects being equal?" Hence "relations as such do not relate," yet "it is of relations as such that we are obliged to speak when we pretend to tell what they are or what they are not". So their experienced status is always *falsified*. Insulation inevitably leads to substantivisation. Anything may be turned into a substantival theme, and so we get 'relational entities' "amphibians which are logically monstrous". The net result is that "of relations we do not mean what we say and do not say what we mean". No wonder "discourse about relations in abstraction from their terms" is "one of the favourite sports of most philosophers". But it is meaningless. "If relations are describable *only* by their terms, they can never be described uniformly or generally," and a host of philosophic problems disappear. "All philosophic controversies about *the problem of relations as such* . . . become simply nonsensical." But this result "is in essential sympathy

with the positive tenets of pluralism and instrumentalism ".] xxvii. 13. **M. Farber.** 'A Review of Recent Phenomenological Literature.' [Mainly about Husserl's *Lectures on Time-Consciousness.*] **G. R. Geiger.** 'The Place of Values in Economics.' [Economics has been trying to become descriptive and to ignore values. But if moral values are squeezed out of the social sciences also, whither are they to go? However the revival of the notion of 'natural rights' as a 'creative fiction' of ethics, empirical, elastic and workable, suggests on what terms values may be reintroduced into a social science. Economics should not confuse the healthy and the morbid, for lack of norms and standards.] xxvii. 14. **S. Hook.** 'Husserl's Phenomenological Idealism.' [Intended as "an exposition rather than an immanent criticism" this account aligns Husserl "beyond any doubt with the tradition of German idealism and leaves as a landmark to his philosophical memory only his critique of sensationalistic naturalism and some positive, albeit strained, analyses of ambiguities in the fundamental categories of psychology." It concludes, "boasting of his independence from all psychology Husserl has fallen a victim to a defective psychology of the knowledge relation. Our choice is not between a logic with psychology or a logic without psychology, but rather between a logic with good psychology and a logic with bad psychology. That, to my mind, is the moral of this exposition of Husserl."] **A. C. Benjamin.** 'The Problem of Knowledge.' [An obscure paper, which concludes that "thought can never grasp existence directly, for existence must be presented in intuitions. Thought is 'about' existence, because it grasps universals. Universals are potentially applicable to an existential system, and when thus applicable they are applicable in a determinate manner though they are incapable of exhausting the complexity of the existential system."] xxvii. 15. **D. Cairns.** 'Mr. Hook's Impression of Phenomenology.' [Questioning of the correctness of Hook's sketch in his brilliant article in xvii. 6, by one whose attitude appears to be purely discipular, but unfortunately does not deal with Hook's fuller version in xxvii, 14, which appears to be quite the most lucid and intelligible account of 'phenomenology' in English.] **H. L. Friess.** 'The Progress of German Philosophy in the Last Hundred Years.' [Makes a gallant attempt to trace a connexion between the lucubrations of academic philosophy and the history of events.]

Revue Néo-Scolastique de Philosophie. xxxii^{e} Année. Deuxième série, No. 26, May, 1930. **L. Noël.** *La présence des choses à l'intelligence.* [In what sense can the object of knowledge be said to be "present" to the intellect? The main Thomist tradition agrees with Kant, as against *e.g.* Descartes, that in human knowledge there is no purely intellectual "intuition"; intuition depends in us on the direct physical presence of the object of sense. But is this experience purely sensuous? John of St. Thomas teaches that there is a sense in which the object is present to the intellect itself *mediante co-ordinatione et continuatione ad sensus.* On the other hand, St. Thomas and Aristotle teach that our intellect only apprehends "singulars" by an indirect "reflection" on the data of sense. Does this not imply that the intellect must already possess at least the confused and implicit concept of 'being,' before the "reflection" takes place? What is it that is "reflected" upon? M. Noël replies that "the quiddity . . . is not originally apprehended in a kind of spiritual empyrean where intelligence is alone with its own notions, like a Leibnizian monad, . . . it does not undergo sensible modifications, but it is associated with

the sensibility which receives them, and thinks the intelligible notion in the heart of the sensible data." In this sense it is true that consciousness is "invaded" by the present reality. It is argued that Cajetan's account of the action of the *intellectus agens* on *phantasmata* implies some such theory.] **P. Archambault.** *La Théorie de la Connaissance dans la philosophie de Maurice Blondel.* [An eloquent "popular" exposition of the main ideas of Blondel's *de l'Action*, dwelling on Blondel's affinities with Pascal and Newman, and the points of difference between his "integral realism" and the doctrines of Bergson and the 'pragmatists.'] **N. Balthasar** and **A. Simonet.** *Le plan de la "Somme Contre les Gentils."* [St. Thomas notoriously begins the **S.C.G.** by distinguishing sharply between supernatural truths and those which are rationally demonstrable. Yet he appears throughout the work to disregard the distinction. How is this apparent contradiction to be explained? Of three proposed explanations: (1) that while **S.C.G.** i.-iii. is strictly philosophical, bk. iv. is theological; (2) that the whole is theology and Thomas has not really adhered to his proposed programme; (3) that the procedure is legitimate against Mohammedan opponents, since *they* profess to demonstrate their own theology by rational proofs, the third is to be preferred. i.-iii. treat of doctrines which really can be rationally demonstrated, iv. of matters wrongly supposed by the opponent to be capable of such treatment. There still remains a difficulty about i.-iii. Does not Thomas appear to be offering demonstration that the true end of man is a supernatural beatitude, and is it not inconsistent with his own presuppositions to regard the proposition as demonstrable? The answer is that St. Thomas's real object is not to demonstrate his thesis, but to refute an objection to it, drawn from the "emanationist" philosophy of the opponents, which finds the "end of man" in union with a "first intelligence," or "active intellect" subordinate to God. What is to be shown, and can be shown by strictly philosophical argument, is that an end other than direct assimilation to God cannot be the supreme end of man. The structure of the **S.C.G.** depends throughout on the historical circumstances of its composition.] **N. Balthasar.** *Bulletin de metaphysique.* Reviews, etc.

Rivista di Filosofia Neo-Scolastica (Sept.-Dec., 1929). **A. Gemelli.** *I rapporti di scienza e filosofia nella storia del pensiero italiano.* [After a historical survey, concludes that neo-scholasticism is the only system which does justice to and reconciles the scientific and the philosophical attitudes.] **R. Amerio.** *Ritrattazione dell' ortodossia campanelliana.* **R. Amerio.** *L'opera teologica di Tommaso Campanella.* **Cristoforo Krzanic.** *La scuola francescana e l'Averroismo.* [Defends the Franciscan school against the charge of being influenced by Averroism.] **Carlo Mazzantini.** *Realtà ed Intelligenza.* [Continuation of previous articles.] **Gustavo Bontadini.** *Valutazione analitica e valutazione dialettica della filosofia moderna.* [On the interpretation of the history of modern philosophy to be given by neo-scholasticism. It is insufficient to extract from it those propositions which are consistent with Christian metaphysics and to reject the rest; the modern concept of experience must be included within neo-scholasticism and taken as the point of departure for a reaffirmation of the Christian doctrine of transcendence.] Notes, discussions, etc. (Jan.-April, 1930). **Martino Grabmann.** *La dottrina di Jacopo Capocci da Viterbo a proposito della realtà e dell' essere divino.* **A. Gemelli.** *Emozioni e sentimenti.* [Takes a functional view of feelings and emotions. "States of feeling are reactions whose development is

determined by utility; they function as guides or auxiliaries or sanctions of action. Sometimes the reaction is violent or excessive; then you have emotion."] **Eugenio di Carlo.** *Un discorso accademico di P. Galluppi su Alfonso De' Liguori.* **Vincenzo Sinistrero.** *La distinzione fra essenza ed esistenza in A. di Hales.* Notes, discussions. Reviews; including a review by Chiocchetti of Kremer's 'La théorie de la connaissance chez les Néo-Réalistes Anglais,' and of a volume by disciples of Gentile (Ugo Spirito, Amaldo Volpicelli, Luigi Volpicelli) criticising the philosophy of B. Croce.

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